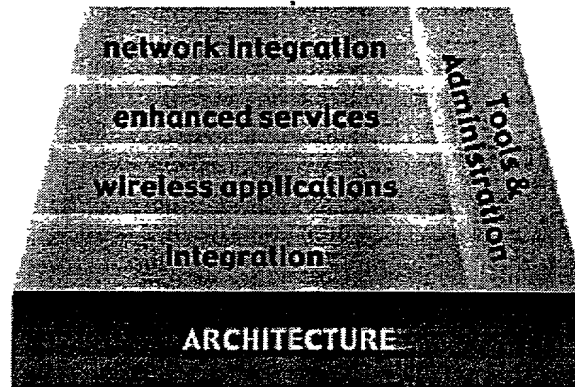




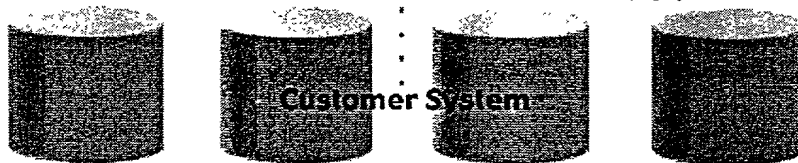
r106

~ 100

Devices



~ 104



~ 102

FIG. 1

Device Layer

106



100

Network Integration Layer

202

WAP Gateway	Home Page Provisioning	CTT/IVR Service	WTA Service	WAP Push Gateway	VoiceXML Gateway	Location Gateway	SMS/Email Gateway
-------------	------------------------	-----------------	-------------	------------------	------------------	------------------	-------------------

Enhanced Services Layer

204

Mail	Cookie Management	Device Mgmt	Session Mgmt	Single Sign-On	Voice Portal	Presentation
Navigation	Transcoding & Harvesting	Security & VPN	2-way Wallet	Authentication	Data Synchron	Personalization

Wireless Application Layer

208

Enterprise Applications	B2B	B2C	Portals	Exchanges	Existing Wireless App	Common Applications
-------------------------	-----	-----	---------	-----------	-----------------------	---------------------

Integration Layer

208

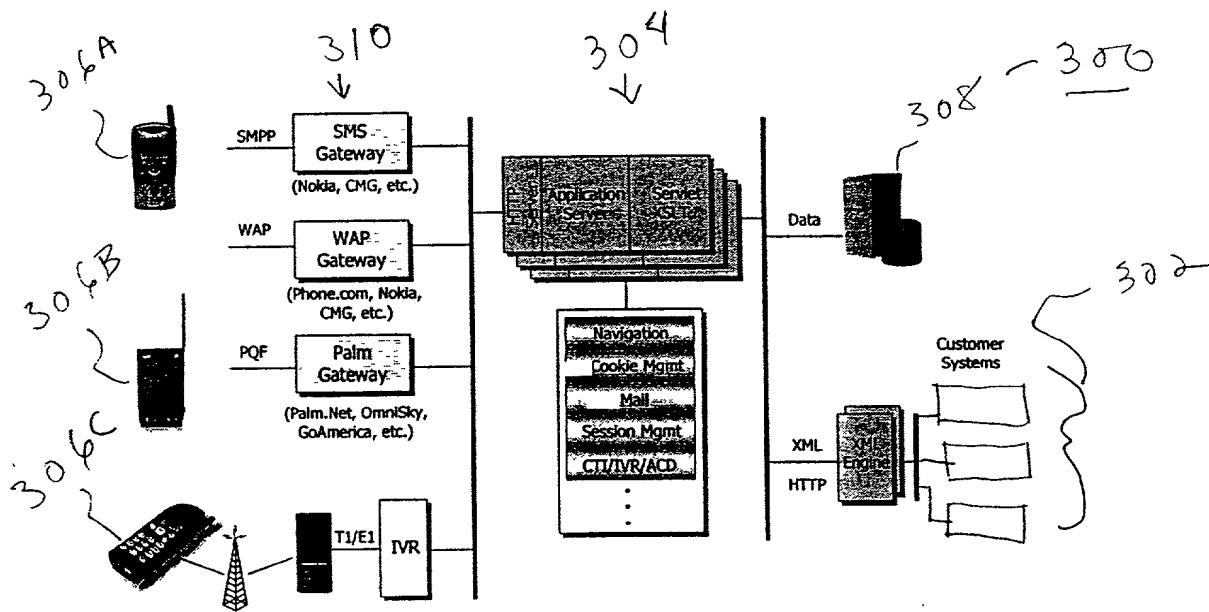
XML Engine	Infrastructure Engine Interface
------------	---------------------------------

Customer System Layer

102



F16. 2



F16. 3

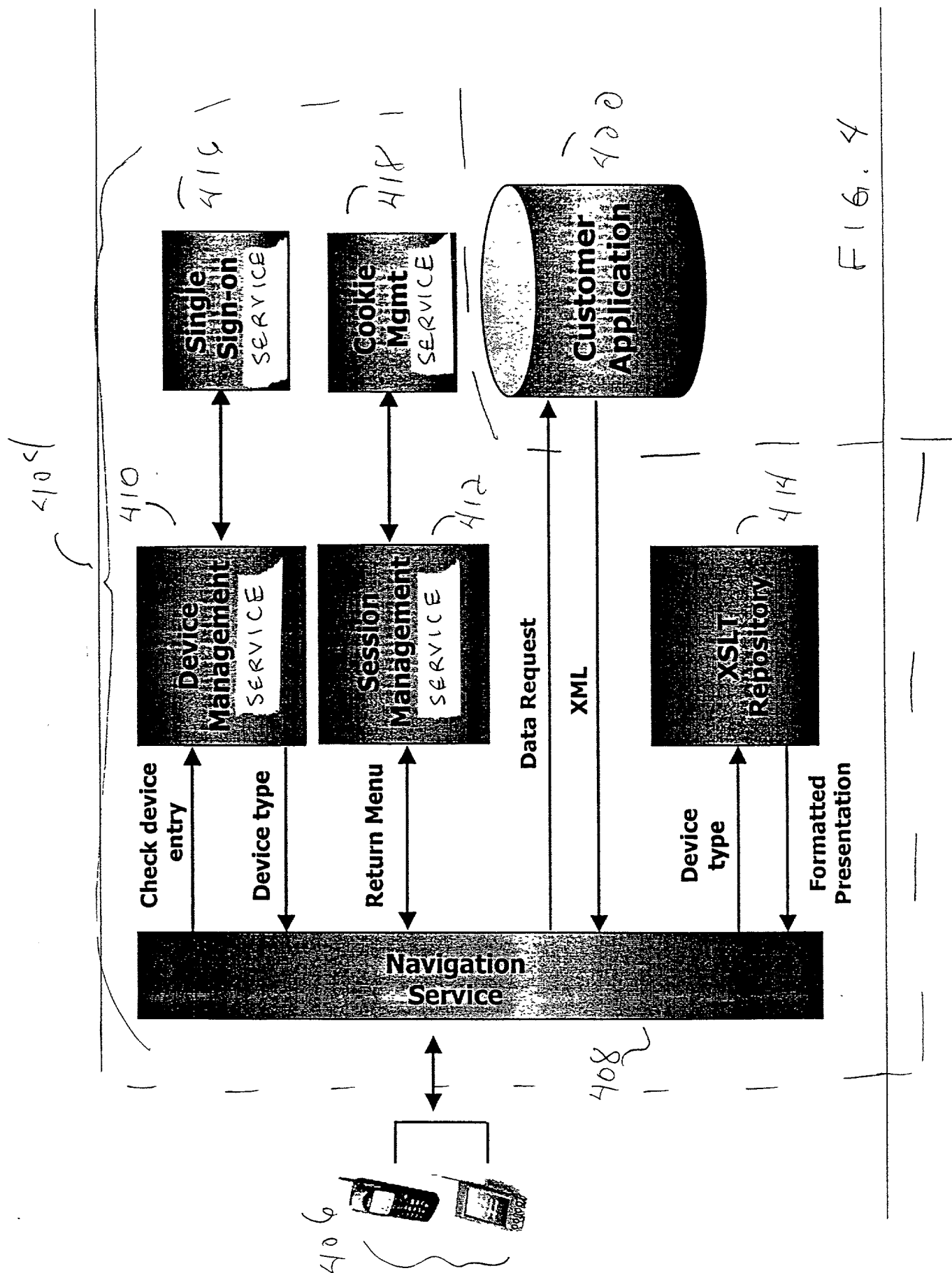


Fig 5.

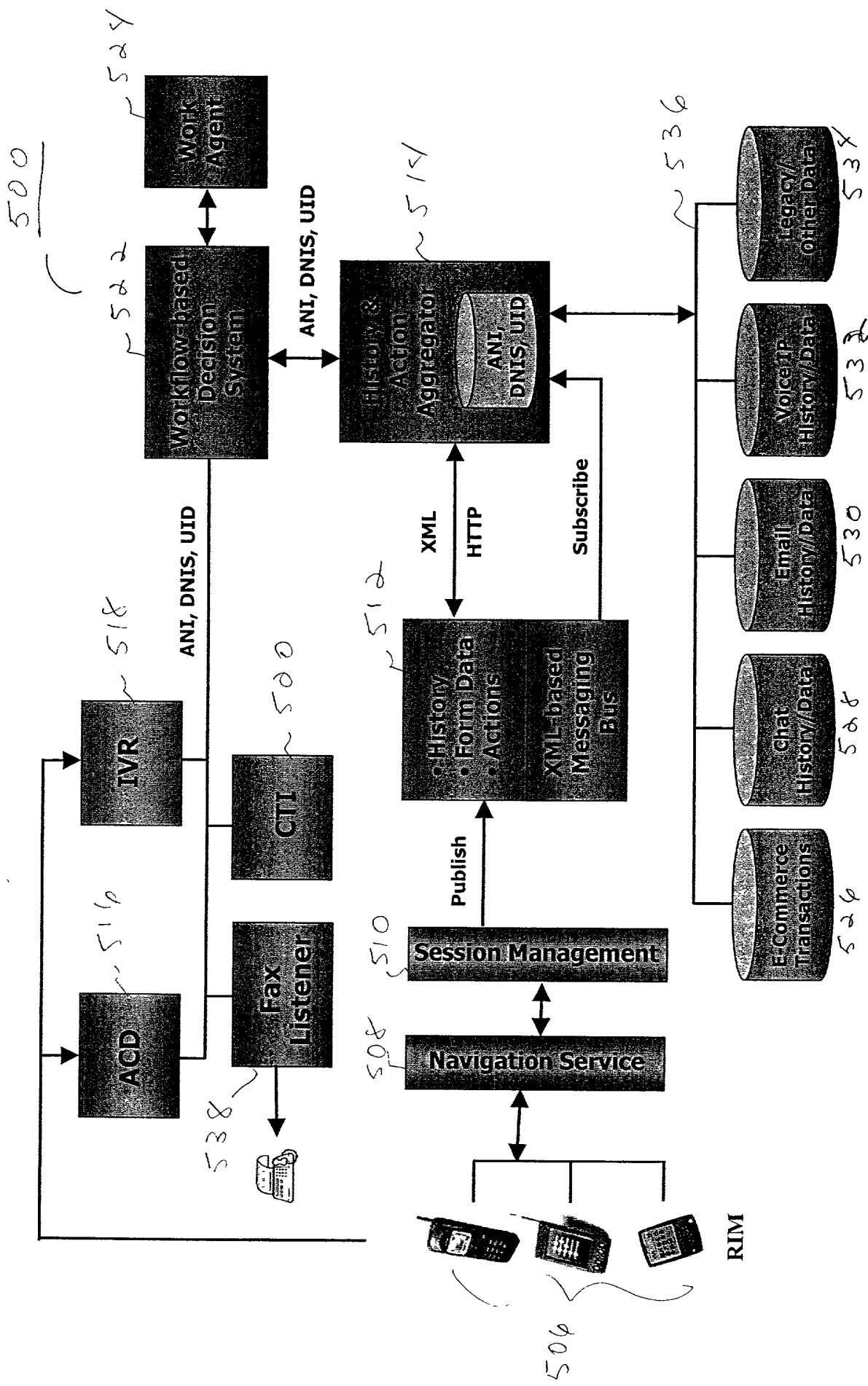
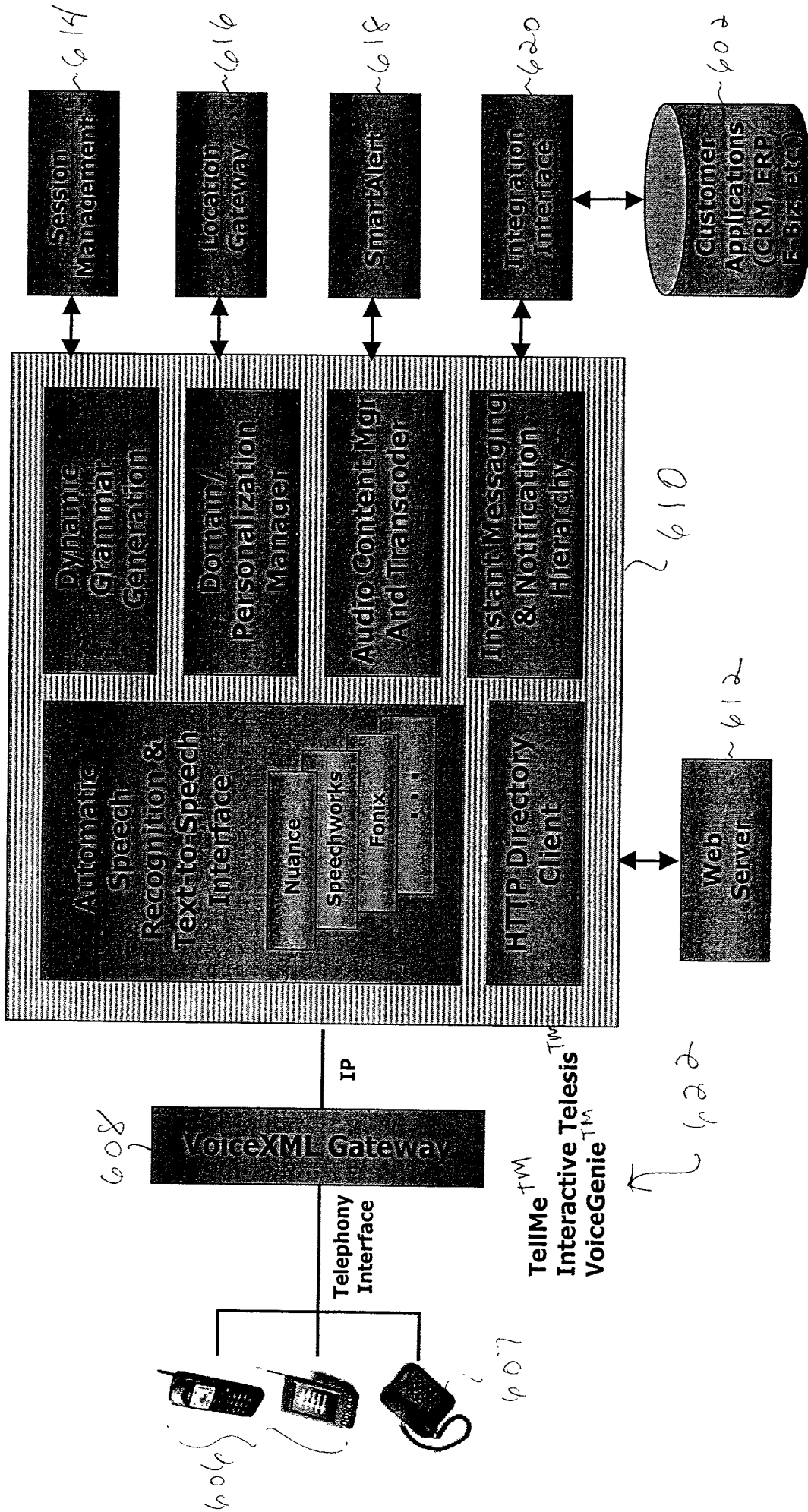
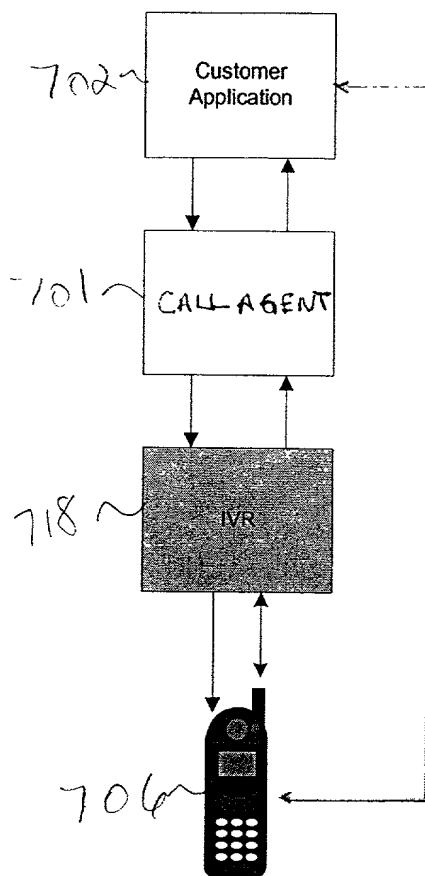


Fig 6.





F1 61. 7

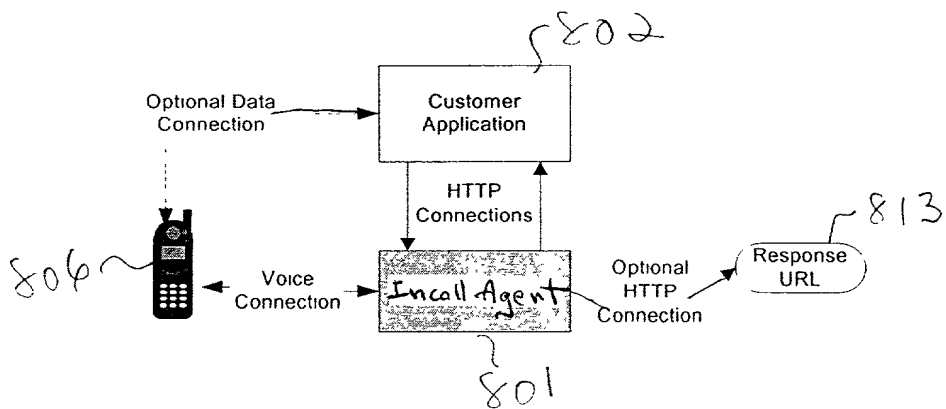
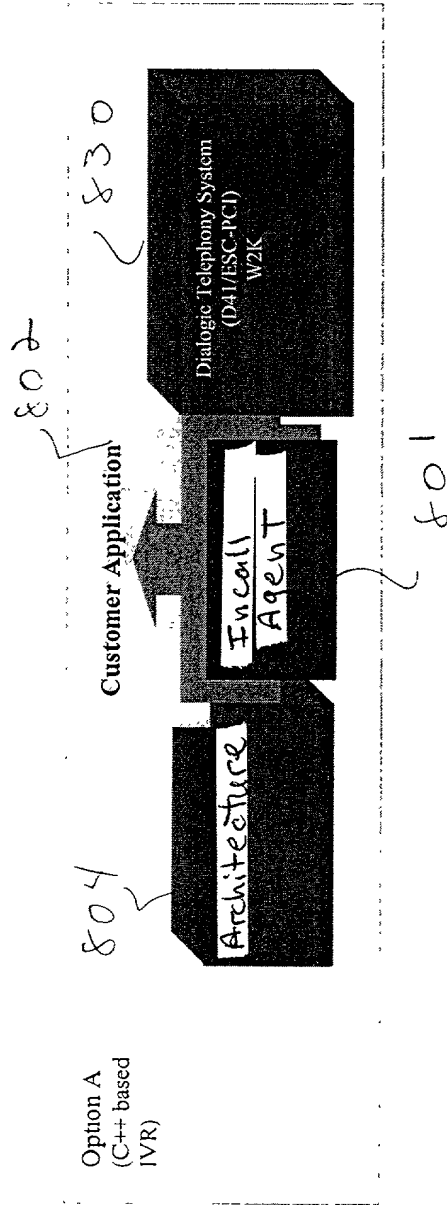
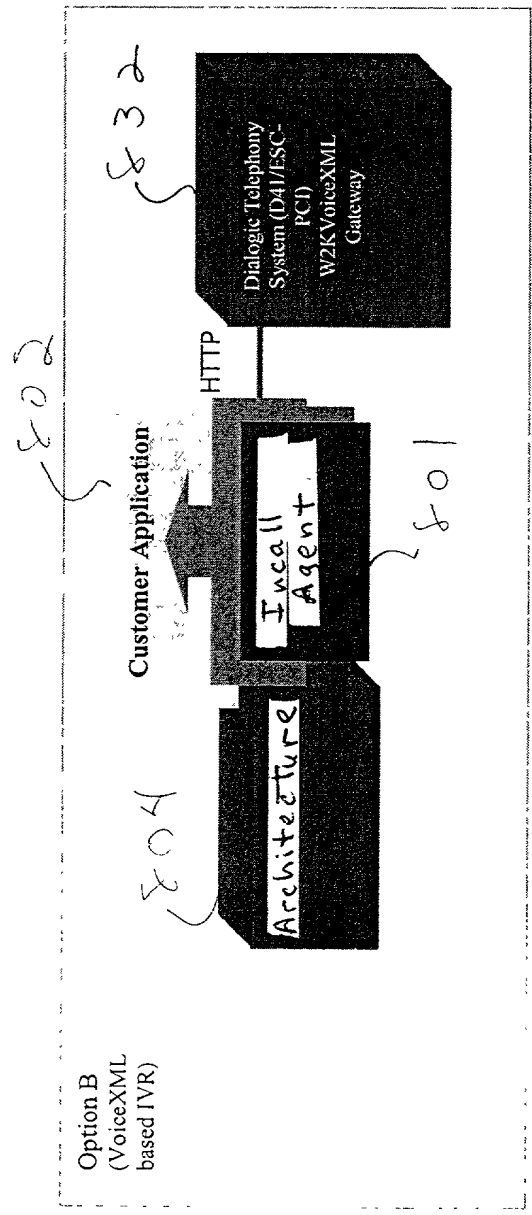


FIG 8A



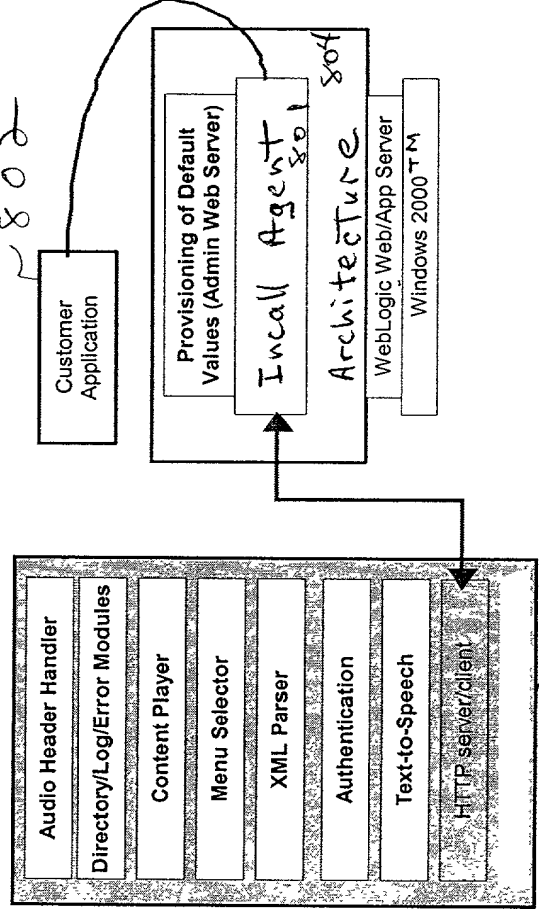
F167.8B

OPTION B (VoiceXML based IVR) is a solution that uses a VoiceXML based IVR to interact with a customer. The IVR is connected to a database and can retrieve information from the database. The IVR can also be connected to a web service and can retrieve information from the web service. The IVR can also be connected to a call center and can route calls to the appropriate agent.



F1678C

FIG. 1 is a block diagram of a system architecture for a web-based application. The system includes a client device (100) and a server device (200). The client device (100) includes a browser (102) and a user interface (104). The server device (200) includes a web server (202) and a database (204). The browser (102) is connected to the web server (202) via a network (106). The user interface (104) is connected to the browser (102). The web server (202) is connected to the database (204). The database (204) stores data for the application.



F168D

FIG. 1 is a block diagram of a system for providing a customer service application. The system includes a mobile device 100, a customer application 200, an Incall Agent 300, and an IVR 400. The mobile device 100 is connected to the customer application 200 via a network 110. The customer application 200 is connected to the Incall Agent 300 via a network 120. The Incall Agent 300 is connected to the IVR 400 via a network 130. The IVR 400 is connected to the mobile device 100 via a network 140. The system is configured to provide a customer service application to a customer via a mobile device.

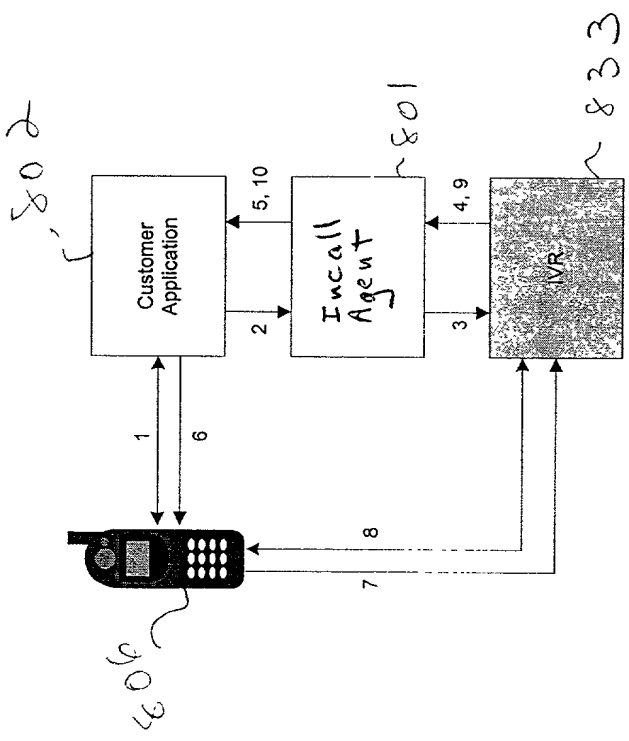


FIG 8E

FIG. 1 is a block diagram of a system for providing a customer service application. The system includes a Customer Application (802), an Incall Agent (801), and an IVR (833). The Customer Application (802) is connected to the Incall Agent (801) via a bidirectional arrow labeled 0 and 7. The Incall Agent (801) is connected to the IVR (833) via a bidirectional arrow labeled 4 and 3,6. The IVR (833) is connected to a mobile phone (806) via a bidirectional arrow labeled 1 and 2,5.

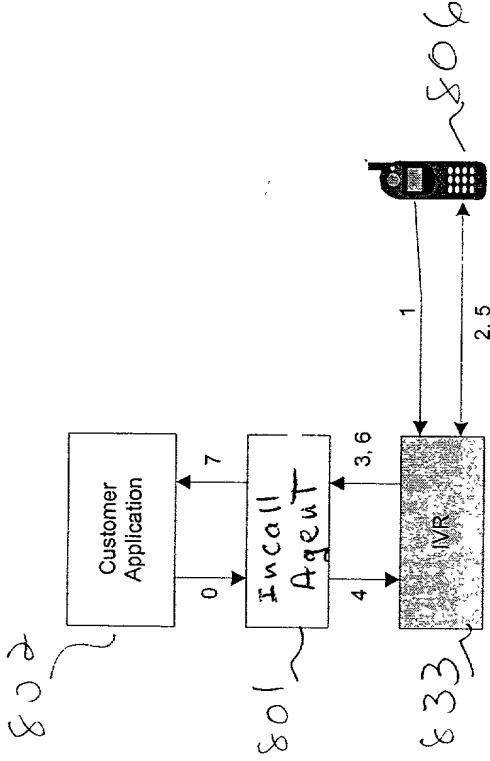
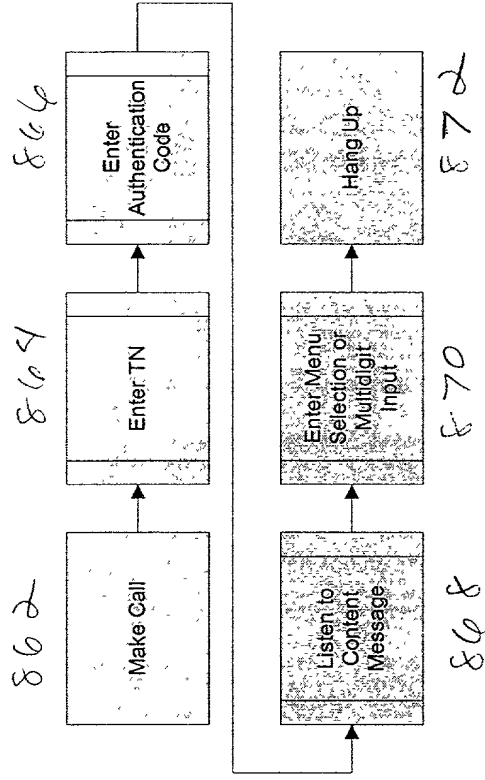


FIG. 1

862 864 866 868 870 872



F 1 6 7 . 8 4

Element:	Incall Service
Attributes:	title
Children:	Service
Description:	A container. A high level tag that marks the start and end of the XML file. Required.
Element:	Service
Attributes:	name
Parents:	Incall Service
Children:	DNIS Service_description Multicall Percall Reset
Description:	A container The parameters in this container describe a service running on a particular phone line (DNIS). Each line running Incall Service must have a service described for that line. Required.
Element:	DNIS
Parents:	Service
Description:	The number the caller dialed to reach the application. Required.
Element:	Service_description
Parents:	Service
Description:	Audio. The description of the service. This audio is played to reassure the caller that they have dialed the right number. Fits the carrier phrase, "Hello You have reached <System_description>." Required
Element:	Multicall
Parents:	Service
Children:	Call_info Authentication Content Choices Value_entry
Description:	A container. The parameters specified in Multicall are to be used as default values for all the calls for the service specified in Service. Any tag may be specified in Multicall. Parameters set here act as default values for all calls for that service until another Multicall file for that service is specified. Optional.
Element:	Percall
Parents:	Service
Children:	Call
Description:	A container Contains the list of calls to be made, one call per Call tag. Required if no Multicall tag specified.
Element:	Call
Attributes:	id
Parents:	Percall
Children:	Call_info Authentication Content Choices Value_entry Reset
Description:	A container. Contains information for a specific call. Required if there is a Percall tag.

Element:	Reset
Parents:	Service Call
Description:	Resets/Cancel a particular call (if used as a child for Call) or all potential calls for a particular service (if used as a child for Service). Optional.
Element:	Call_info
Parents:	Multicall Call
Children:	Phone_number Response_url
Description:	A container Contains information about the call, beyond the dialog. Required in either Multicall or Call or both.

F16.9A

Element:	Authentication
Parents:	Multicall Call
Children:	Authentication_code_description Authentication_code Expected_caller
Description:	A container. Contains tags that specify the information necessary for ensuring that the caller is authorized to use the service. Authentication is indicated if there is an authentication_code passed in from the customer's application. If there is an authentication_code, there must also be a description of that code. Optional.
Element:	Content
Parents:	Multicall Call
Description:	Audio. The content message to be played to the caller. The content may be an audio file (*.wav), a text file (*.txt), or raw text (enclosed in double quotes). Optional.
Element:	Value_entry
Parents:	Multicall Call
Attributes:	mindigits maxdigits
Description:	Audio. A description of the entry to be entered by the called party. Must fit carrier phrase, "Please enter.. " and "You will be asked for . " Either Choices or Value_entry, but not both, may be specified. Optional.
Element:	Choices
Parents:	Multicall Call
Children:	Choice Transfer
Description:	A container. Contains information about the list of choices that will be presented to the caller during the call. Optional.
Element:	Phone_number
Parents:	Call_info
Description:	Phone number from which Expected_caller is expected to call. Required.
Element:	Expected_caller
Parents:	Authentication
Description:	Audio. The name of the person expected to be calling from a given phone number. Optional.

Element:	Response_url
Parents:	Call_info
Description:	URL that Incall Service is to use to return status information about the call to the customer application. Optional.
Element:	Authentication_code_description
Parents:	Authentication
Description:	Audio. Description of the authentication code the caller will be asked to enter. Fits the carrier phrase, "Please enter <authentication_code_description>." For example, "Please enter your account number." Required for each Authentication tag.

F16.9B

Element:	Authentication_code
Parents:	Authentication
Description:	The digit string value of the caller's authentication_code_description. That is, the Authentication_code is the value that the caller must enter in order to continue with the call. Required for each Authentication tag.
Element:	Choice
Parents:	Choices
Children:	Choice_description Choice_value
Description:	A container. Describes the choices that are available to the caller. There is usually more than one Choice tag per Choices tag. Optional.
Element:	Transfer
Parents:	Choices
Children:	Transfer_description Transfer_number
Description:	A container. Describes the transfer option available to the caller. If there is a transfer option, the value that the caller presses is "0" in order to transfer. Only one Transfer tag is allowed per Choices tag. Optional.
Element:	Choice_description
Parents:	Choice
Description:	Audio. Describes the option the caller may choose. Fits the carrier phrase, "If you would like <choice_description>, press one." Required for each Choice tag.
Element:	Choice_value
Parents:	Choice
Description:	A single digit number that indicates the touch-tone that the caller should press in order to select the associated choice. Note that if there is a Transfer tag, "0" cannot be used for a Choice_value. Required for each Choice tag.
Element:	Transfer_description
Parents:	Transfer
Description:	Audio. Describes the person or thing (e.g., IVR) the caller would be transferred to should they press zero. Required for each Transfer tag.
Element:	Transfer_number
Parents:	Transfer
Description:	The phone number to which the caller would be transferred, if they press zero. Required for each Transfer tag.

FIG. 9C

1. Incall_Mfile_SC1_1.xml

```
<?xml version='1.0'?>
<Incall Service title="Joe's Sales M file">

  <Service name="movie sales">
    <DNIS>5122900001</DNIS>
    <Service_description>"Joe's Movie Sales"</Service_description>

    <Multicall>
      <Authentication>
        <Authentication_code_description>"movie pin"</Authentication_code_description>
      </Authentication>

      <Choices>
        <Choice>
          <Choice_description>C:\Mob\purchase_DVD.wav</Choice_description>
          <Choice_value>1</Choice_value>
        </Choice>
        <Choice>
          <Choice_description>C:\Mob\purchase_movie_video.wav</Choice_description>
          <Choice_value>2</Choice_value>
        </Choice>

        <Choice>
          <Choice_description>C:\Mob\purchase_soundtrack.wav</Choice_description>
          <Choice_value>3</Choice_value>
        </Choice>

        <Transfer>
          <Transfer_description>"Kathy's phone"</Transfer_description>
          <Transfer_number>460</Transfer_number>
        </Transfer>

      </Choices>
    </Multicall>
  </Service>

  <Service name="theater sales">
    <DNIS>5122900003</DNIS>
    <Service_description>"Joe's Stage Productions Stuff Sales"</Service_description>

    <Multicall>
```

F16.10A

CONTINUED FROM FIG. 10A

```
<Authentication>
  <Authentication_code_description>"theater pin"</Authentication_code_description>
</Authentication>

<Choices>
  <Choice>
    <Choice_description>C:\Mob\purchase_theater_video.wav</Choice_description>
    <Choice_value>1</Choice_value>
  </Choice>

  <Choice>
    <Choice_description>C:\Mob\purchase_playbill.wav</Choice_description>
    <Choice_value>2</Choice_value>
  </Choice>
</Choices>
</Multicall>
</Service>

</Incall Service>
```

FIG. 10B

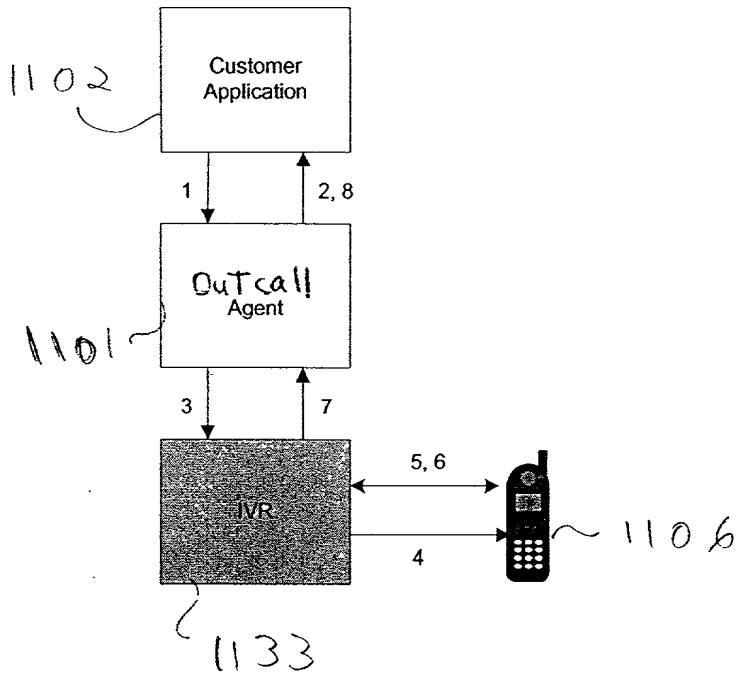


FIG. 11A

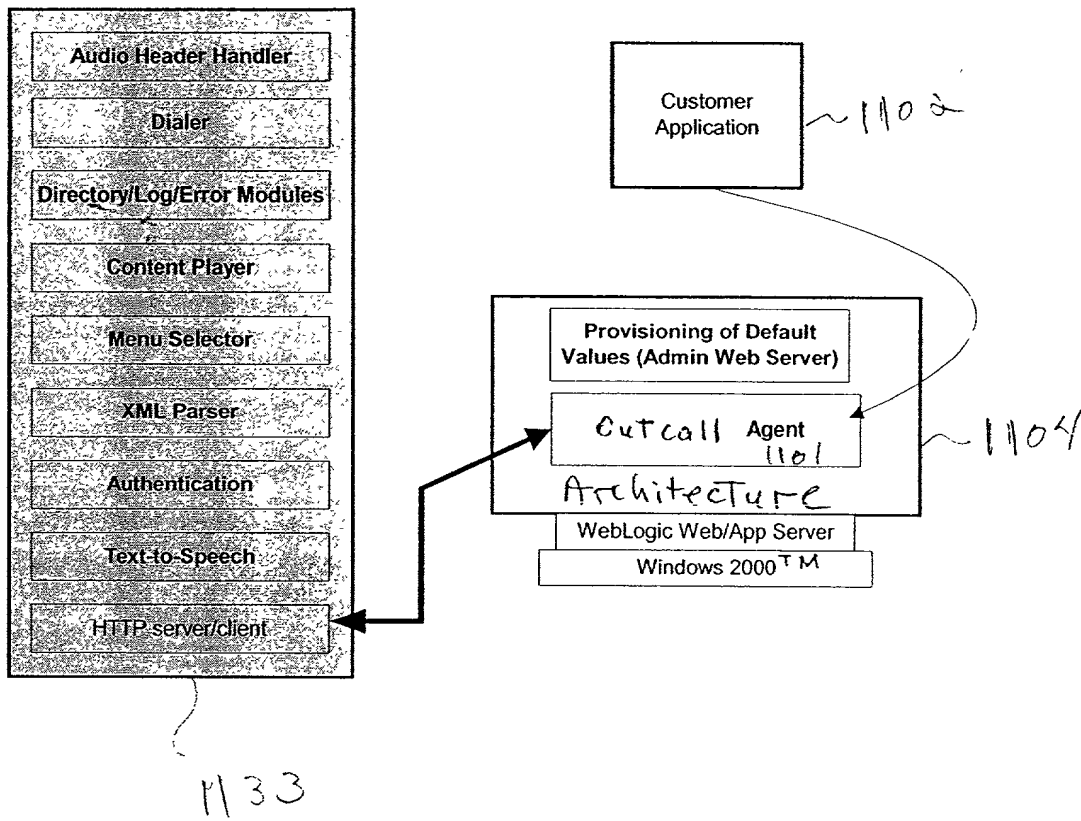


FIG. 11B

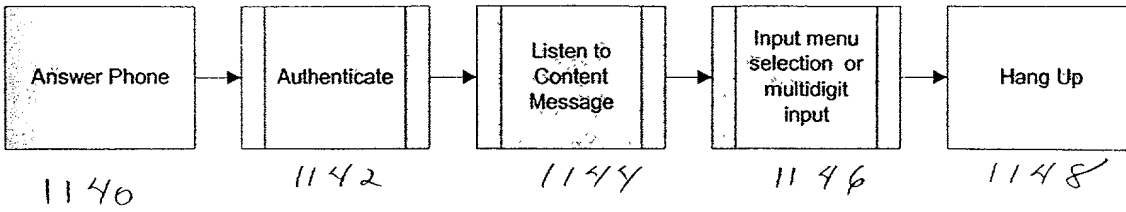


FIG. 11C

Element:	Outcall service
Attributes:	title
Children:	Multicall Percall
Description:	A container. A high level tag to mark the start and end of the XML file. Required.

Element:	Service
Attributes:	name
Parents:	Outcall service
Children:	Service_description Multicall Percall Reset
Description:	A container. The parameters in this container describe a service. There can be several services set up for Outcall. This tag allows the developer to group Multicall values. Required.

Element:	Multicall
Parents:	Service
Children:	Call_info Introduction Authentication Content Value_entry Choices
Description:	A container. Indicates that the parameters specified are to be used as default values for all the calls. Any tag may be specified in multicall. Parameters set here act as default values for all calls until another multicall file is specified. Optional.

Element:	Percall
Parents:	Service
Children:	Call
Description:	A container. Contains the list of calls to be made, one call per Call tag. Required if no Multicall tag specified.

Element:	Reset
Parents:	Service Call
Description:	Resets values for parent tag and all its children tags already specified. Useful for canceling queued calls before they're made. Optional.

Element:	Call
Attributes:	id
Parents:	Percall
Children:	Call_info Introduction Authentication Content Value_entry Choices Reset
Description:	A container. Contains information for a specific call. Required if there is a Percall tag

Element:	Call_info
Parents:	Multicall Call
Children:	Phone_number Response_url Ensure_completion
Description:	A container. Contains information about the call, beyond the dialog. Required in either Multicall or Call or both.

Element:	Introduction
Parents:	Multicall Call
Children:	Recipient Sender
Description:	A container. Contains the information for the introduction portion of the call, the sender and the desired recipient. Required in either Multicall or Call or both.

F16 12A

Element:	Authentication
Parents:	Multicall Call
Children:	Authentication_code_description Authentication_code
Description:	A container. Contains tags that specify the information necessary for ensuring that the called party is the intended recipient of the call. Optional. Authentication is indicated if there is an authentication_code passed in from the customer's application. If there is an authentication_code, there must also be a description of that code and a recipient.

Element:	Content
Parents:	Multicall Call
Description:	Audio. The content message to be played to the called party. The content may be an audio file (* wav), a text file (*.txt), or raw text (enclosed in double quotes) Optional.

Element:	Value_entry
Parents:	Multicall Call
Attributes:	mindigits maxdigits
Description:	Audio. A description of the entry to be entered by the called party. Must fit carrier phrase, "Please enter..." and "You will be asked for..." Either Choices or Value_entry, but not both, may be specified. Optional.

Element:	Choices
Parents:	Multicall Call
Children:	Choice Transfer
Description:	A container. Contains information about the list of choices that will be presented to the user during the call. Either Choices or Value_entry, but not both, may be specified. Optional.

Element:	Phone_number
Parents:	Call_info
Description:	Phone number to be called. Must include every digit that is to be dialed (e.g., 9 to get an outside line, 1 for long distance). Required.

Element:	Response_url
Parents:	Call_info
Description:	URL that Outcall service is to use to return status information about the call to the customer application. Optional.

Element:	Ensure_completion
Parents:	Call_info
Description:	The number of times that Outcall service will call a person back, if the person has authenticated. These callbacks increase the likelihood of the completion of a desired call that was dropped accidentally (for instance, by the network). Optional. Default is 0.

Element:	Recipient
Parents:	Introduction
Description:	Audio. Usually text to be converted to speech. Fits the carrier phrase, "This is an automated call for <Recipient> from <Sender>." If Recipient is omitted from the XML, no authentication is done; rather, the called party is asked to press 1 to continue. Optional.

Element:	Sender
Parents:	Introduction
Description:	Audio. Fits the carrier phrase, "This is an automated call from <Sender>." Required

Element:	Authentication_code_description
Parents:	Authentication
Description:	Audio. Description of the authentication code the called party will be asked to enter. Fits the carrier phrase, "Please enter <authentication_code_description>." For example, "Please enter your account number." Required for each Authentication tag.

F16.12B

Element:	Authentication code
Parents:	Authentication
Description:	The digit string value of the called party's authentication_code_description. That is, the Authentication_code is the value that the called party must enter in order to continue with the call. Required for each Authentication tag.

Element:	Choice
Parents:	Choices
Children:	Choice_description Choice_value
Description:	A container. Describes the choices that are available to the called party. There is usually more than one Choice tag per Choices tag. Optional

Element:	Transfer
Parents:	Choices
Children:	Transfer_description Transfer_number
Description:	A container. Describes the transfer option available to the called party. If there is a transfer option, the value that the called party presses is "0" in order to transfer. Only one Transfer tag is allowed per Choices tag. Optional.

Element:	Choice_description
Parents:	Choice
Description:	Audio. Describes the option the called party may choose. Fits the carrier phrase, "If you would like <choice_description>, press one." Required for each Choice tag.

Element:	Choice_value
Parents:	Choice
Description:	A single digit number that indicates the touch-tone that the called party should press in order to select the associated choice. Note that if there is a Transfer tag, "0" cannot be used for a Choice_value. Required for each Choice tag.

Element:	Transfer_description
Parents:	Transfer
Description:	Audio. Describes the person or thing the called party would be transferred to should they press zero. Required for each Transfer tag.

Element:	Transfer_number
Parents:	Transfer
Description:	The phone number to which the called party would be transferred, if they press zero. Required for each Transfer tag.

F16.12C

1. Multi-call content definition file: OM1_short.xml

This XML file defines a hypothetical outcall use case where every called party will be presented with a short audio review of a movie. Then, users will be presented with a menu of two choices (purchase the DVD or purchase the video) or transferring to a call center.

```
<?xml version='1.0'?>
<Outcall service title="Outcall Test M file">
<Multicall>
  <Call_info>
    <Response_url>http://vpl-
mars/servlet/Outcall_serviceResponse</Response_url>
  </Call_info>
  <Content>C:\SmartOutcall\Sounds\princess_bride_x2.wav</Content>
  <Choices>
    <Choice>
      <Choice_description>
        C:\SmartOutcall\Sounds\purchase_DVD.wav
      </Choice_description>
      <Choice_value>1</Choice_value>
    </Choice>
    <Choice>
      <Choice_description>
        C:\SmartOutcall\Sounds\purchase_movie_video.wav
      </Choice_description>
      <Choice_value>2</Choice_value>
    </Choice>
    <Transfer>
      <Transfer_description>"Kathy's phone"</Transfer_description>
      <Transfer_number>4939880</Transfer_number>
    </Transfer>
  </Choices>
</Multicall>
</Outcall service>
```

FIG. 13A

2. Per-call IVR definition file: OP1_short.xml

This XML file defines an outcall request using the current content definition (see the previous XML file) by specifying a 10-digit phone number to be called (9252517200) and the 4-digit passcode (4321) to determine if the person who answers the call is really "John Smith" as authorized to hear the subsequent audio content.

```
<?xml version='1.0'?>
<Outcall service title="Outcall Test P file">
<Percall>
  <Call id="12345">
    <Call_info>
      <Phone_number>9252517200</Phone_number>
    </Call_info>
    <Authentication>
      <Authentication_code_description>
        "your authentication code"
      </Authentication_code_description>
      <Authentication_code>4321</Authentication_code>
    </Authentication>
    <Introduction>
      <Sender>"Test system"</Sender>
      <Recipient>"John Smith"</Recipient>
    </Introduction>
  </Call>
</Percall>
</Outcall service>
```

Generic Dialog Sample

User: Hello.

System: Hello. This is an automated call for <Recipient> from <Sender>. If you are <Recipient>, please enter <Authentication_code_description> followed by the pound key.

User: *Enters <Authentication_code>*

System: I heard *digits_entered* If this is correct, press one.

User: Presses 1

System: Thank you. A message from <Sender> is next. Some important options follow the message. The message is less than one minute long. Beginning of message. <Content> End of message. That was your message. To hear the message again, press the star key. Please choose from one of the following # *choices* choices. If you would like <Choice_description(1)>, press <Choice_value(1)>. If you would like <Choice_description(2)>, press <Choice_value(2)>. ... If you would like to be transferred to <Transfer_description>, press 0.

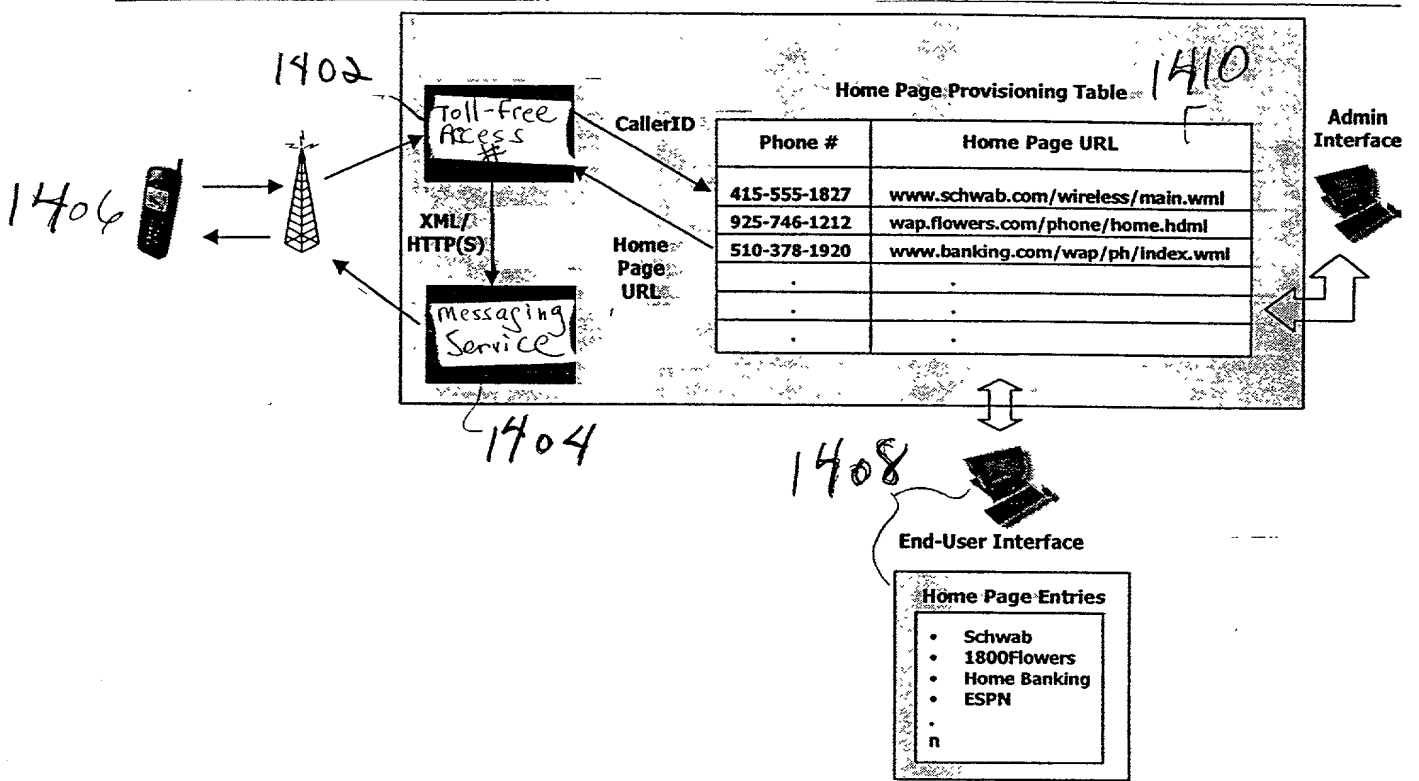
User: Enters 2

System: To confirm that you would like <Choice_description(2)>, press one.

User: Enters 1

System: Your choices of <Choice_description(2)> has been confirmed. Thank you. Good-bye.

F16. 13 B



F16.14

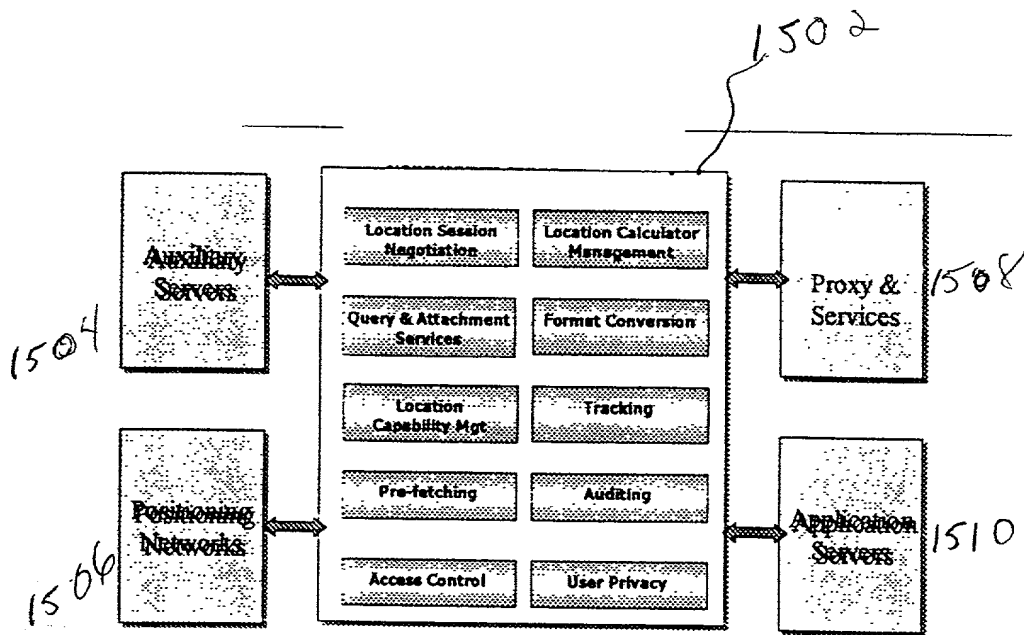
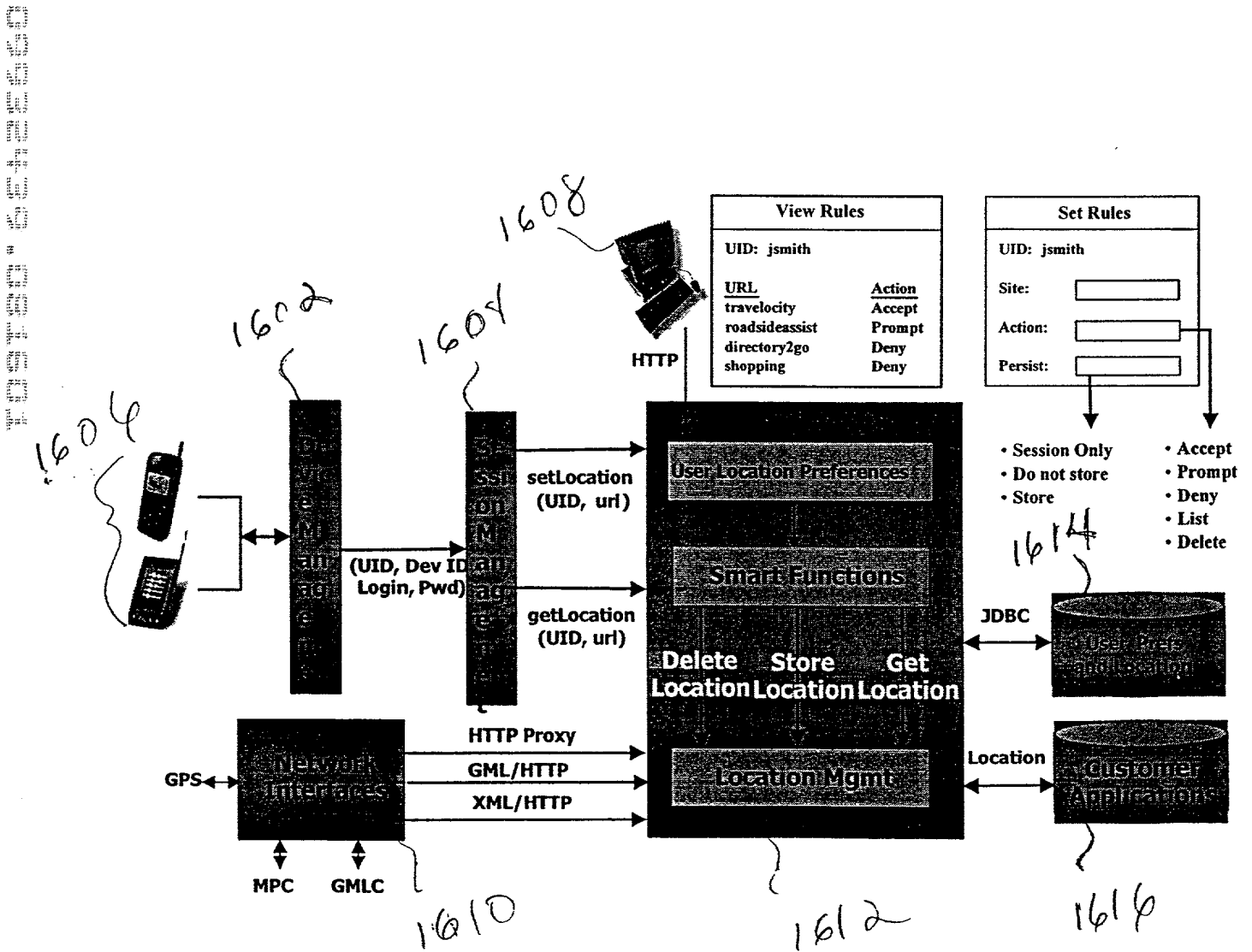
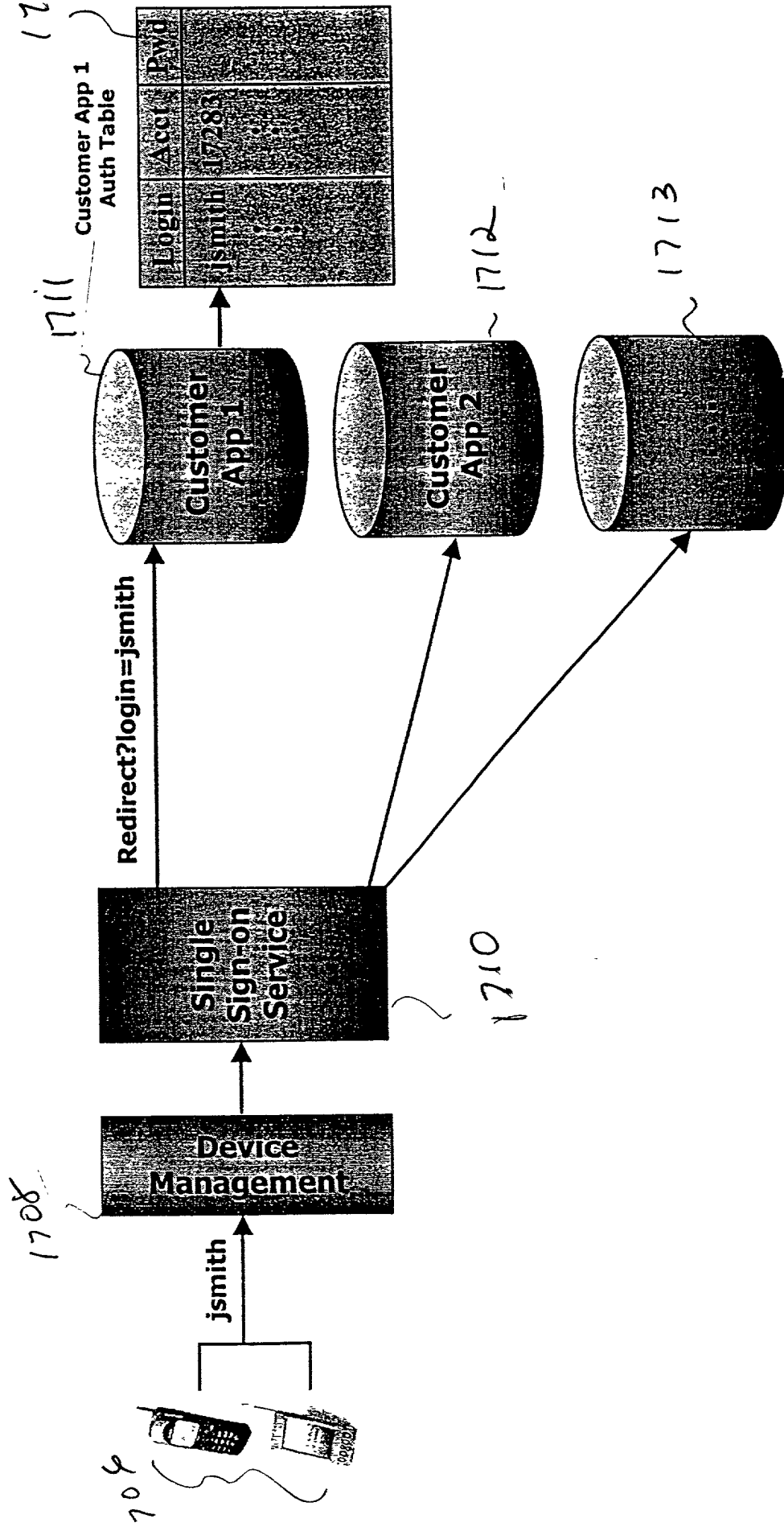


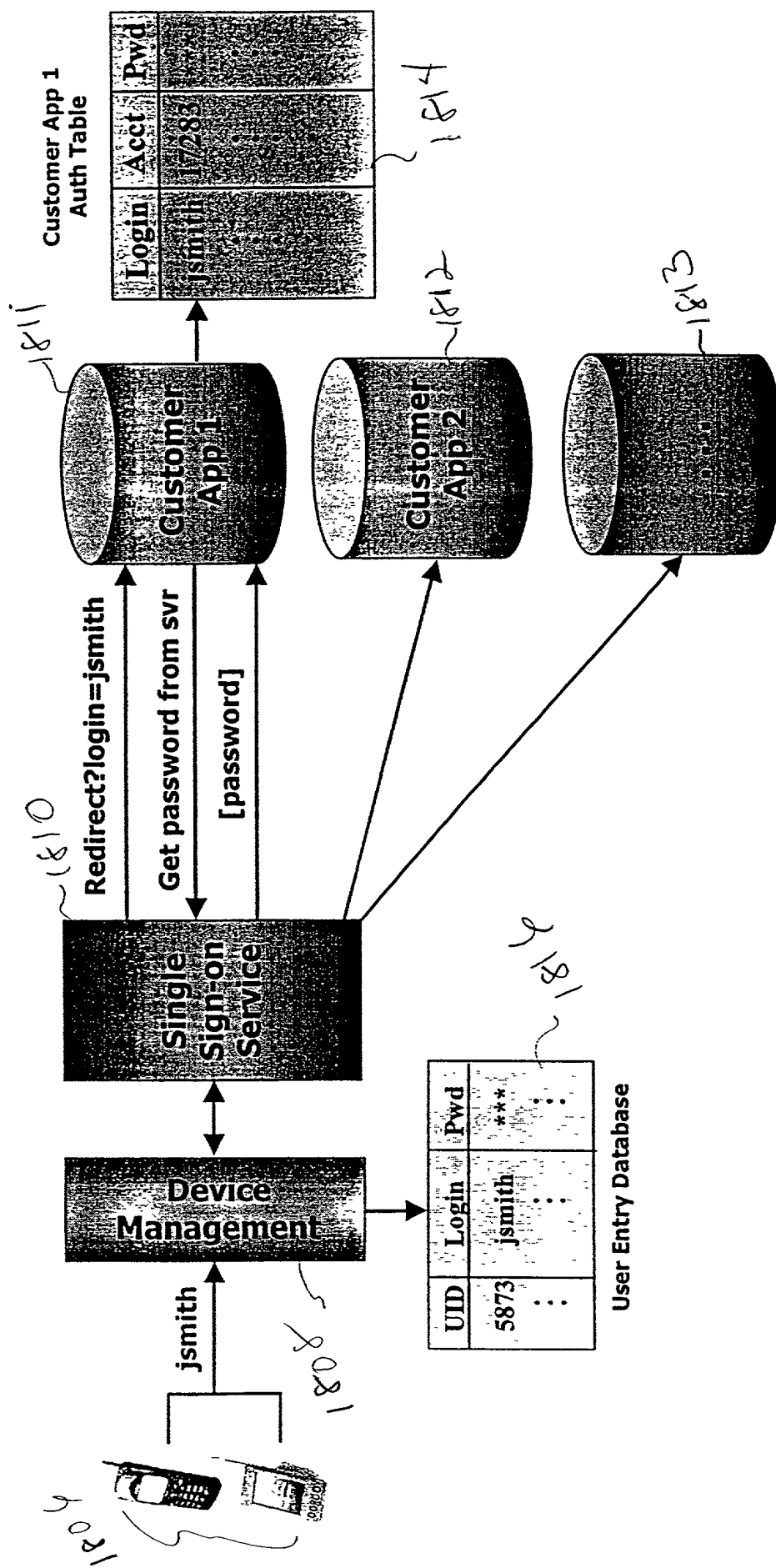
FIG. 15

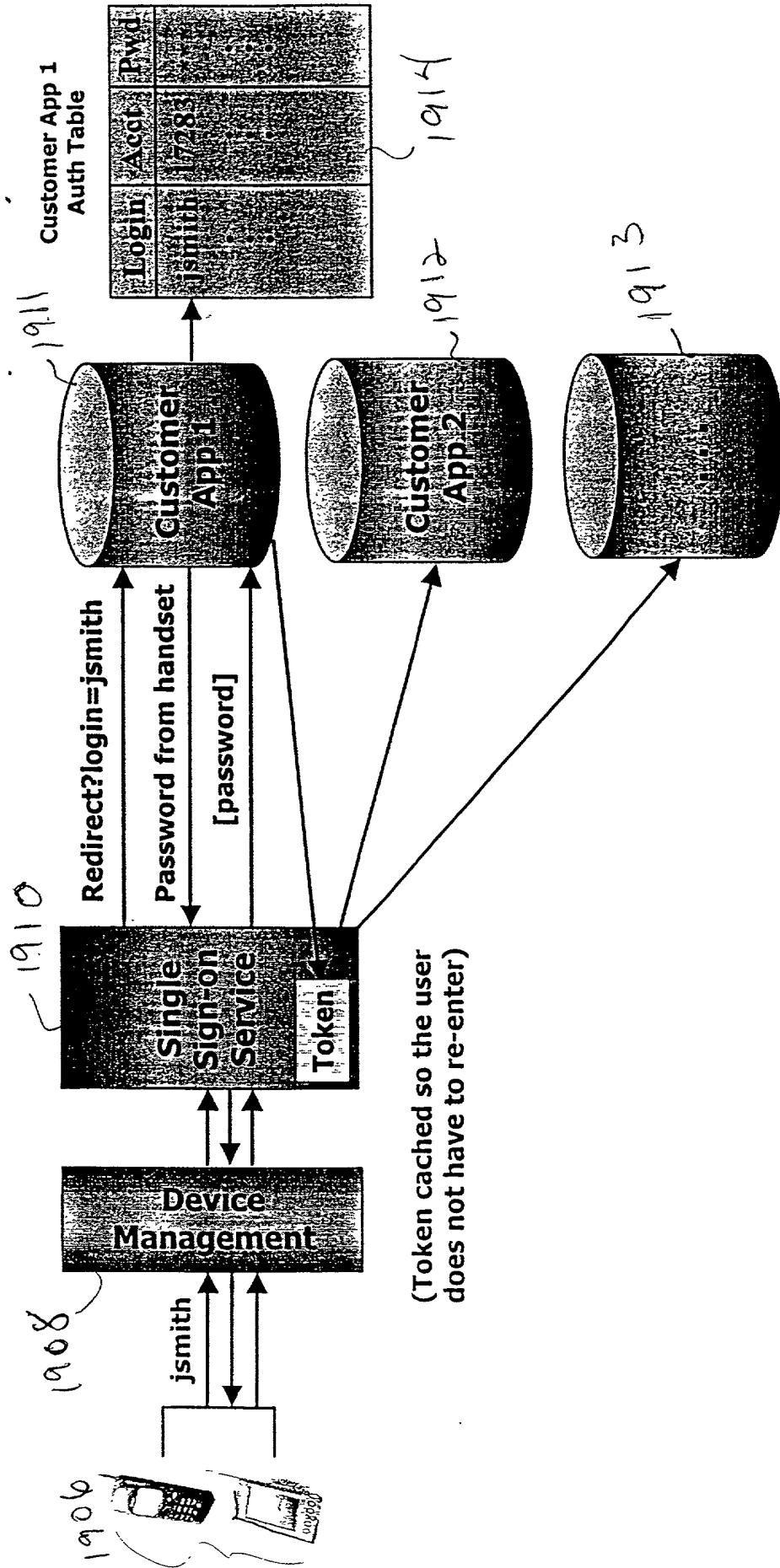
F 18.16



4727







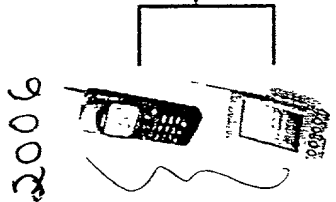
www.mdemo.com/... www.mdemo.com/... www.mdemo.com/...

2008

Menu

- 1 Resume
- 2 Start New
- 3 History List

Navigation Service



Configure Session Mgmt

Company A

Homepage URL:	<input type="text" value="url"/>
History Stack:	<input type="text" value="size"/>
Transaction Stack:	<input type="text" value="size"/>
URL Form Prefill:	<input type="text" value="yes/no"/>
Session Time:	<input type="text" value="time"/>

HTTP

History List

UID	URL
5873	www.mdemo.com/travel/info.wml?dest=maui
5873	www.mdemo.com/travel/golf.wml?course=kapalua
...	...

UID	Form Data
5873	Form1 data
5873	Form2 data
...	...

User Session Data

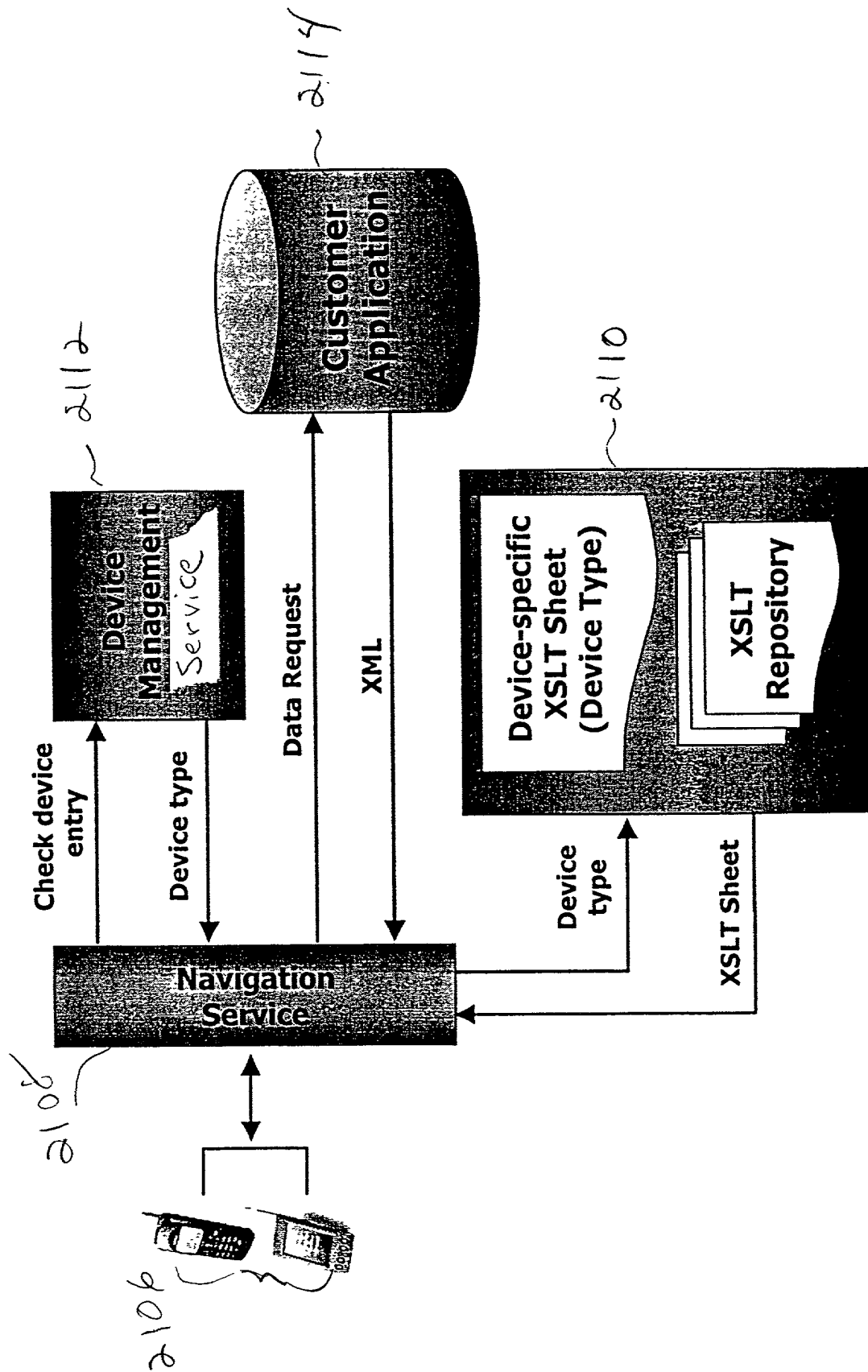
Cookie Management

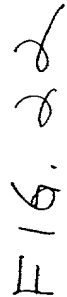
2014

2018

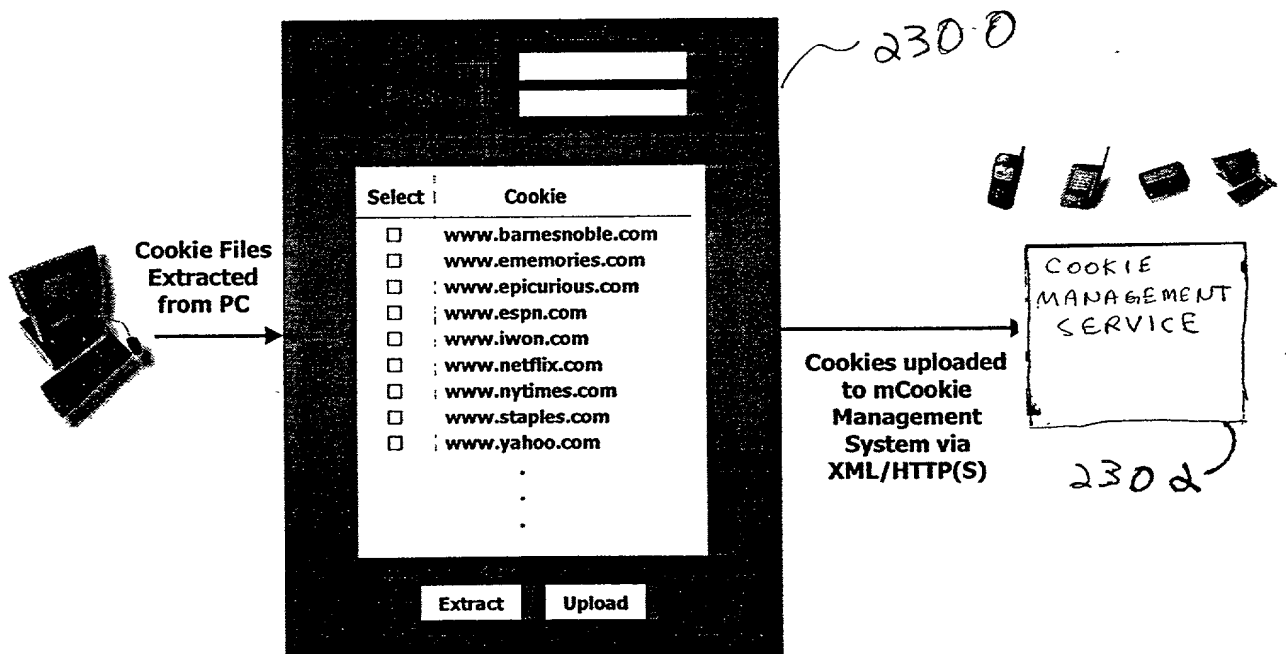
2012

2014





1968



F16.23

FIG. 1 is a block diagram of a system for managing mobile devices. The system includes a mobile device 100, a navigation service 200, a device entry database 300, a user entry database 400, a session management module 500, a cookie management module 600, and a single sign-on service 700. The mobile device 100 is connected to the navigation service 200. The navigation service 200 is connected to the device entry database 300 and the user entry database 400. The device entry database 300 is connected to the session management module 500, the cookie management module 600, and the single sign-on service 700. The user entry database 400 is connected to the session management module 500, the cookie management module 600, and the single sign-on service 700.

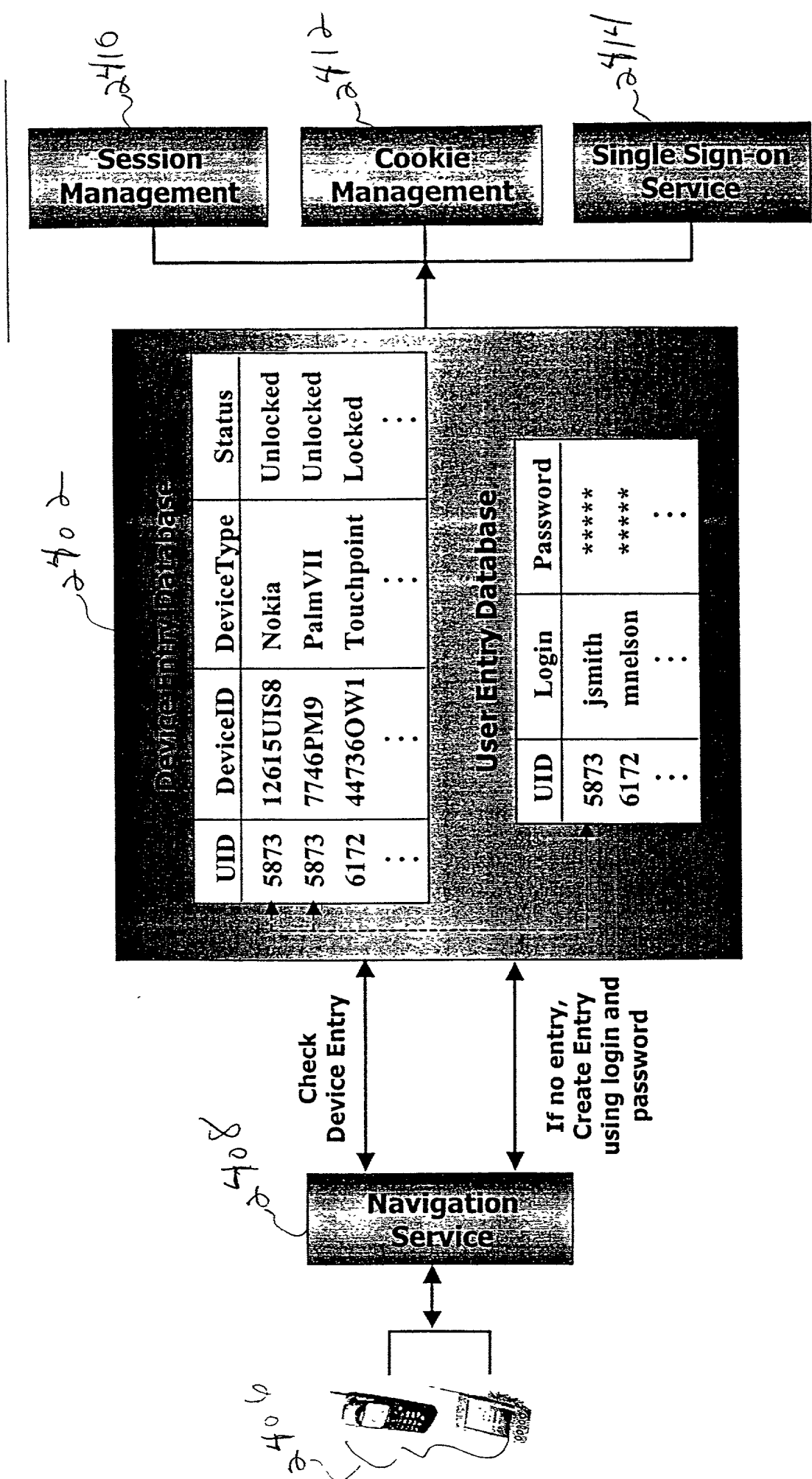


FIG. 24

FIG. 16 is a block diagram of a system for alerting a user of a mobile device. The system includes a wireless application, a routing agent, a no response agent, an alert queuing service, and an alert response agent. The routing agent receives alerts from the wireless application and routes them to the appropriate agent. The no response agent sends alerts to the alert queuing service, which then sends them to the alert response agent. The alert response agent sends alerts to the mobile device via SMS, WAP, Email, or IVR.

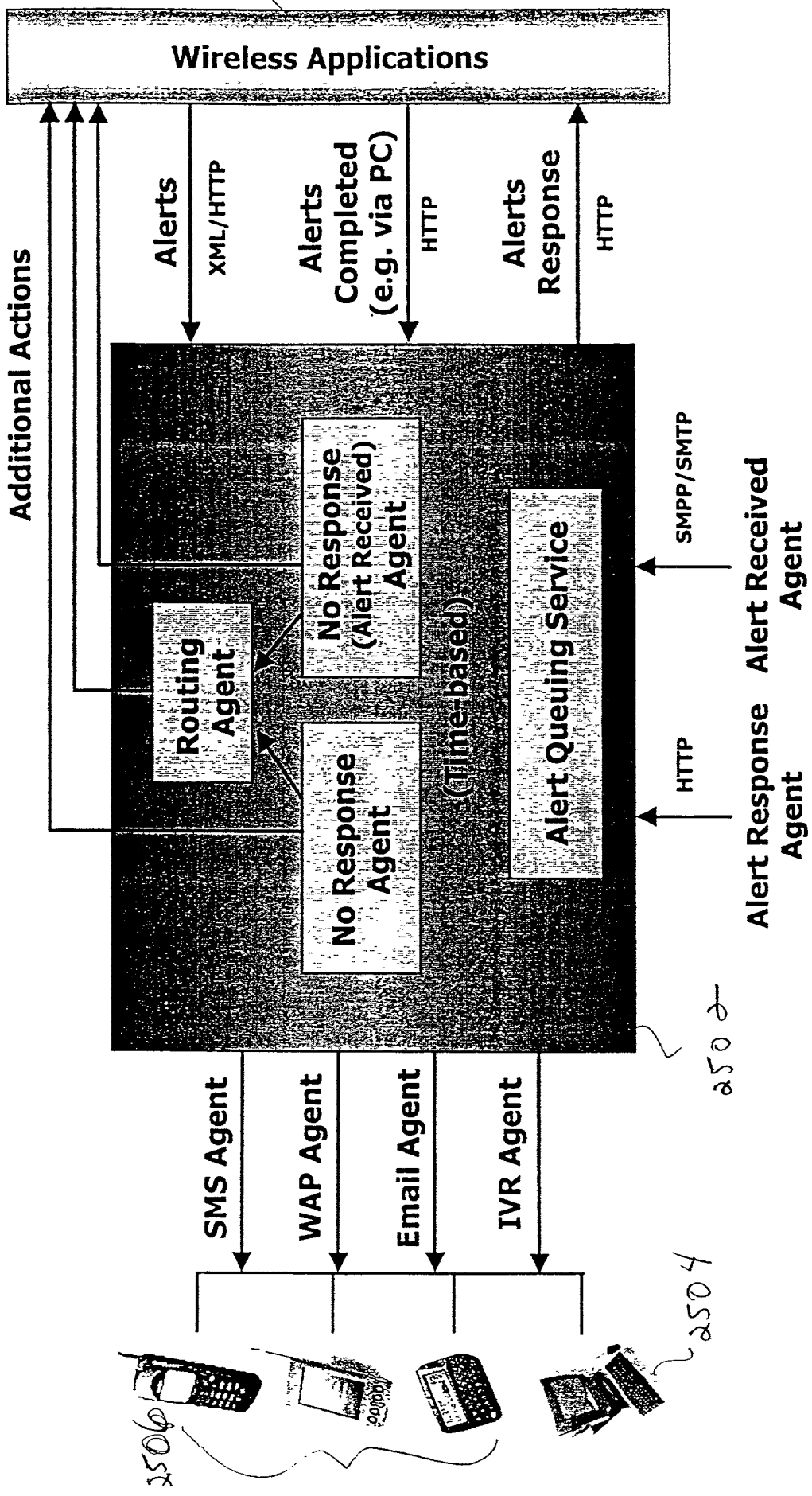
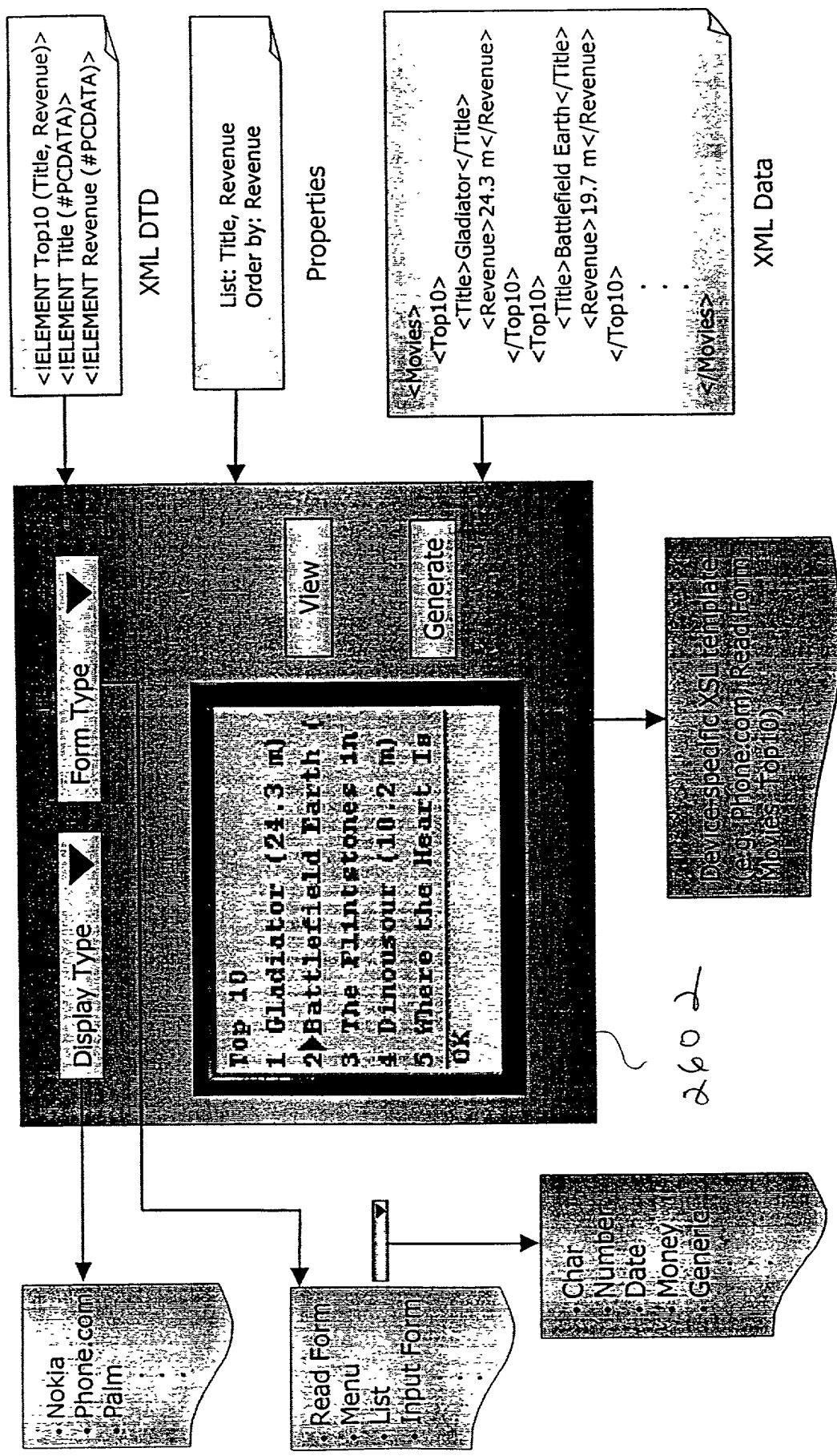
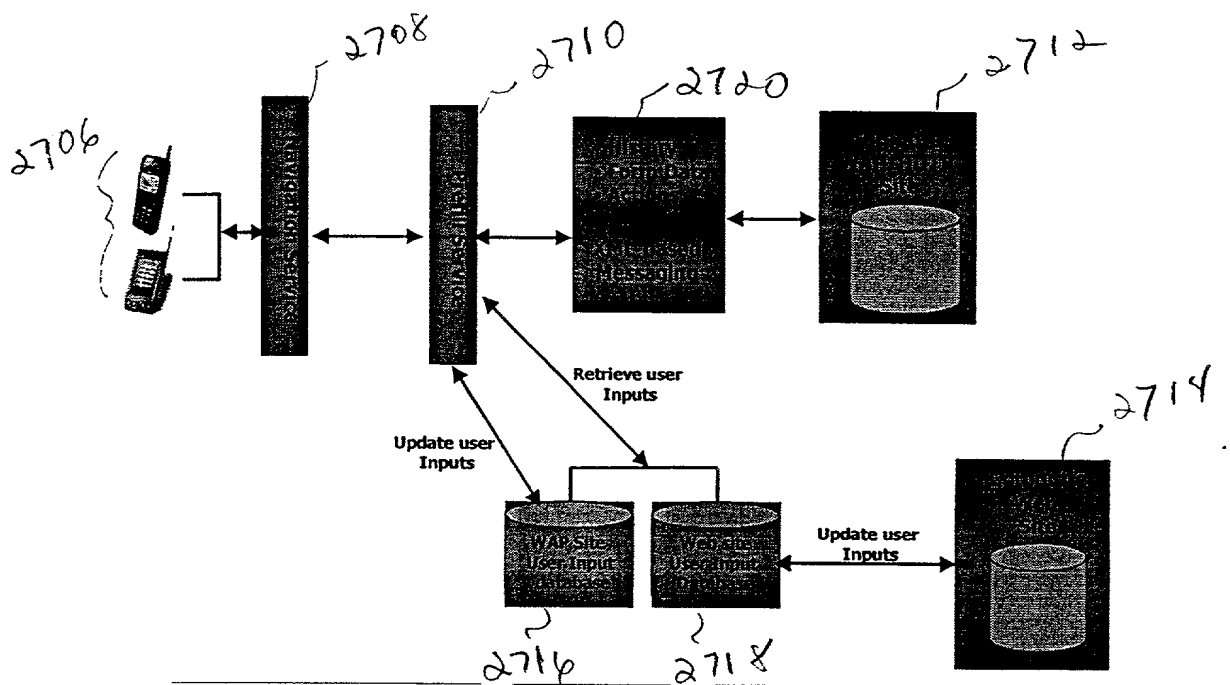


FIG. 16.25





F16.27

FIG. 28 is a block diagram of a system for authenticating a user. The system includes a user device 2806, a network 2808, a server 2814, a password management service 2802, and a database 2812. The user device 2806 is connected to the network 2808 via a 2-4-2-6-4-9 connection. The network 2808 is connected to the server 2814. The server 2814 is connected to the password management service 2802. The password management service 2802 is connected to the database 2812 via an LDAP query. The database 2812 is connected to the password management service 2802 via a standard password query. The password management service 2802 is also connected to the database 2812 via a real password query (bhairix*5).

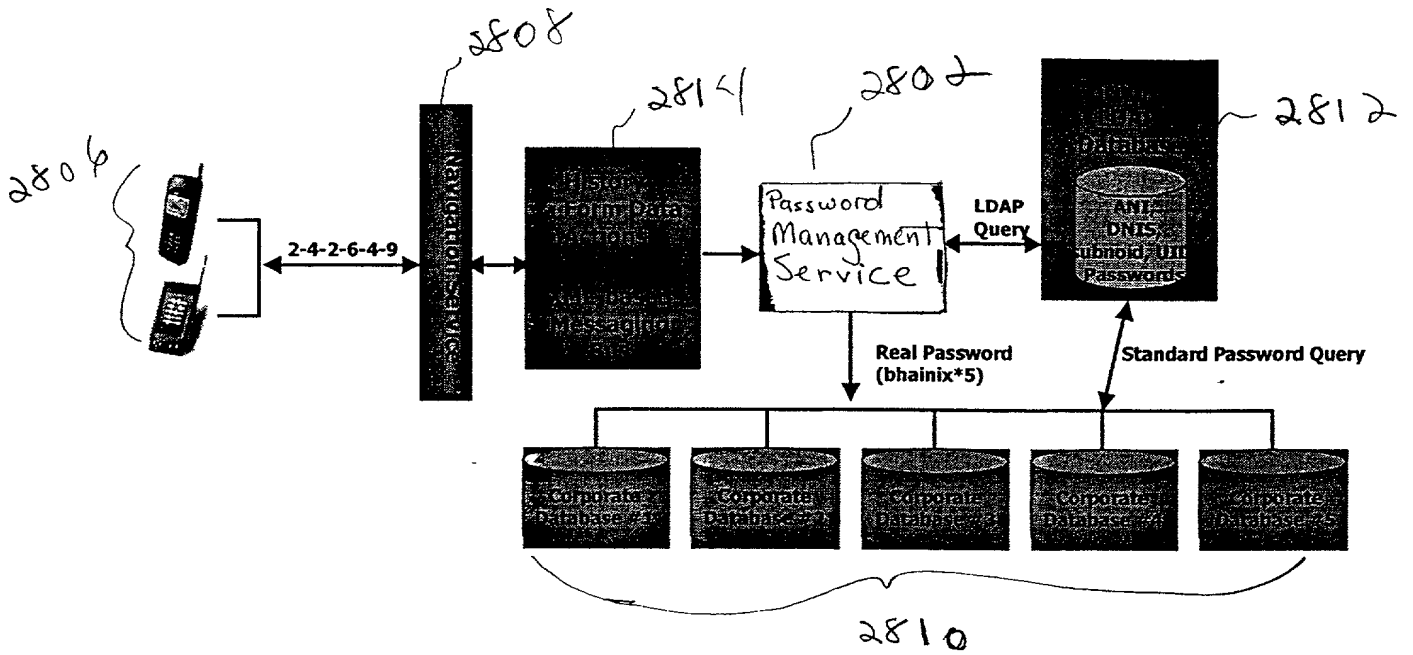


FIG. 28

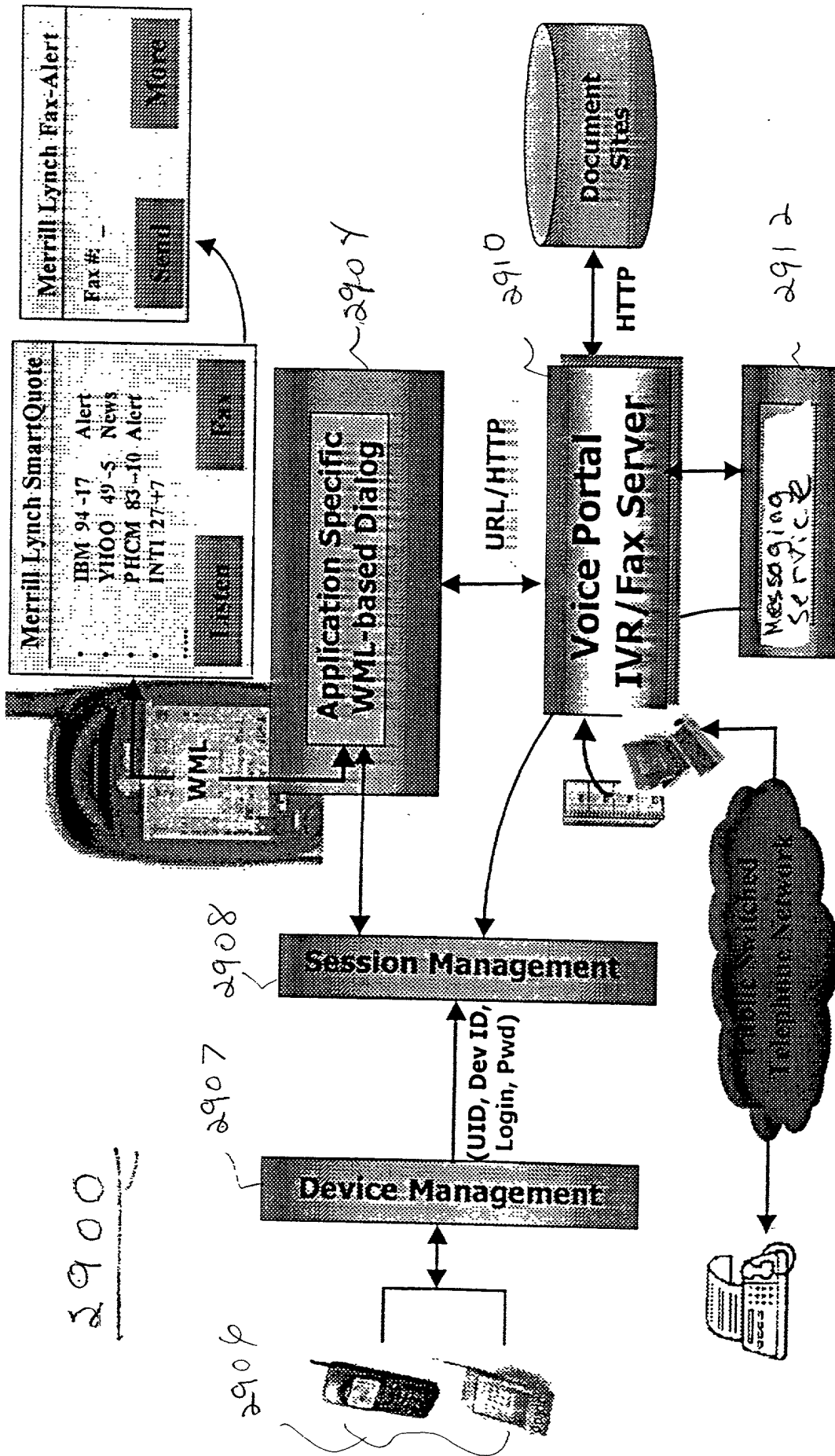
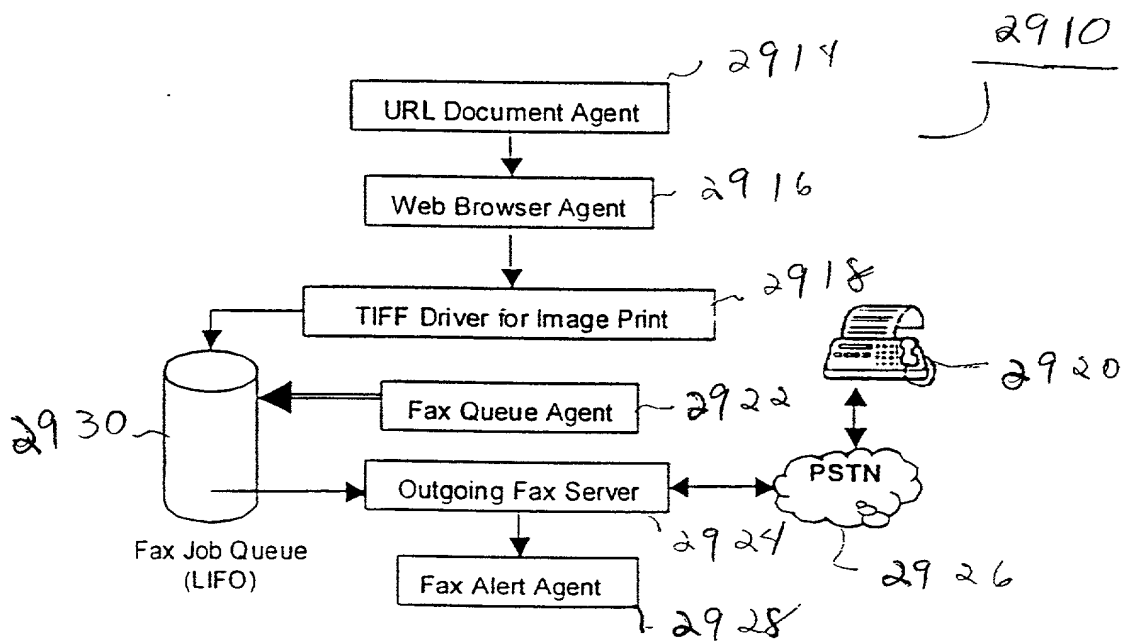


FIG. 29A



F16. 29 B

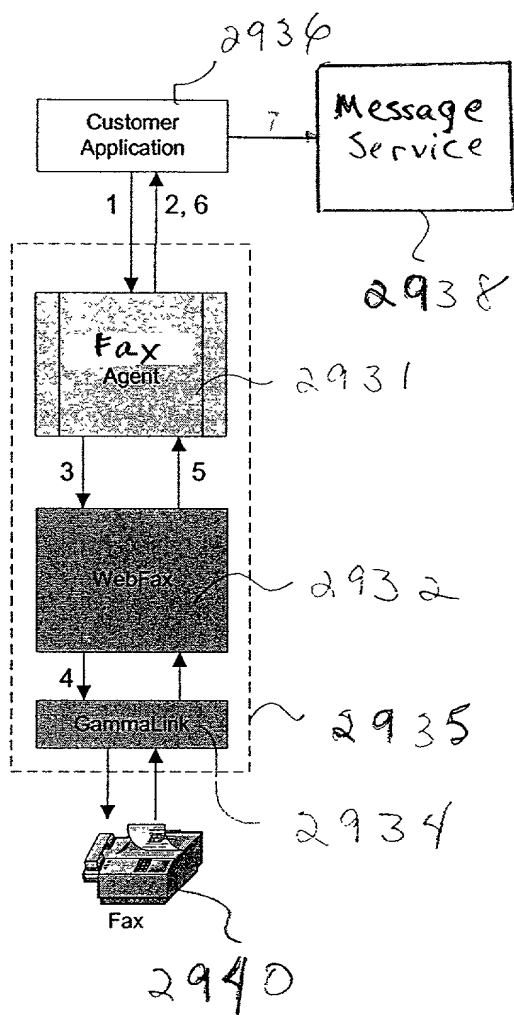


FIG. 29C

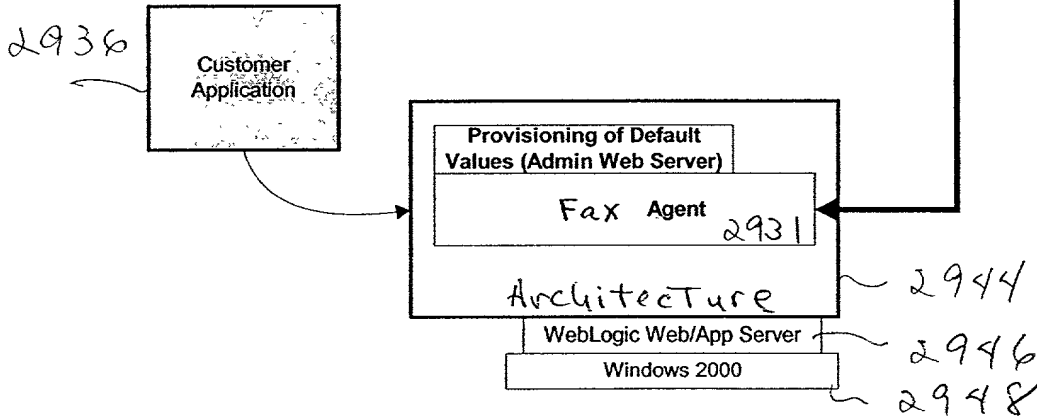
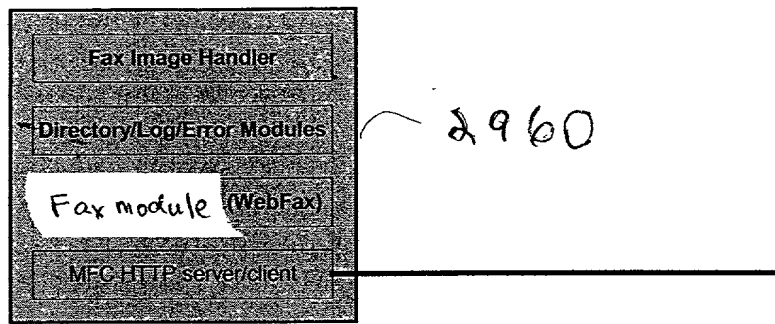


FIG. 29D

FIGURE 3000: A system architecture diagram showing a central Secure XML Engine (3002) interacting with various components. The engine receives data from a laptop (3004) via HTTP and sends data to a desktop (3006) via HTTP. It also interacts with a Single Sign-on Service (3008) and a Device Management (3010) component, which are optional. The engine is connected to multiple eBusiness Secure XML Engines (3012, 3014, 3016) via HTTP. The eBusiness engines send data back to the central engine via (1) URL, (2) Request Wallet, (3) Wallet in XML, and (4) Cookie. A list of data types (Credit Card, Shipping, Billing, User info, etc.) is shown on the right.

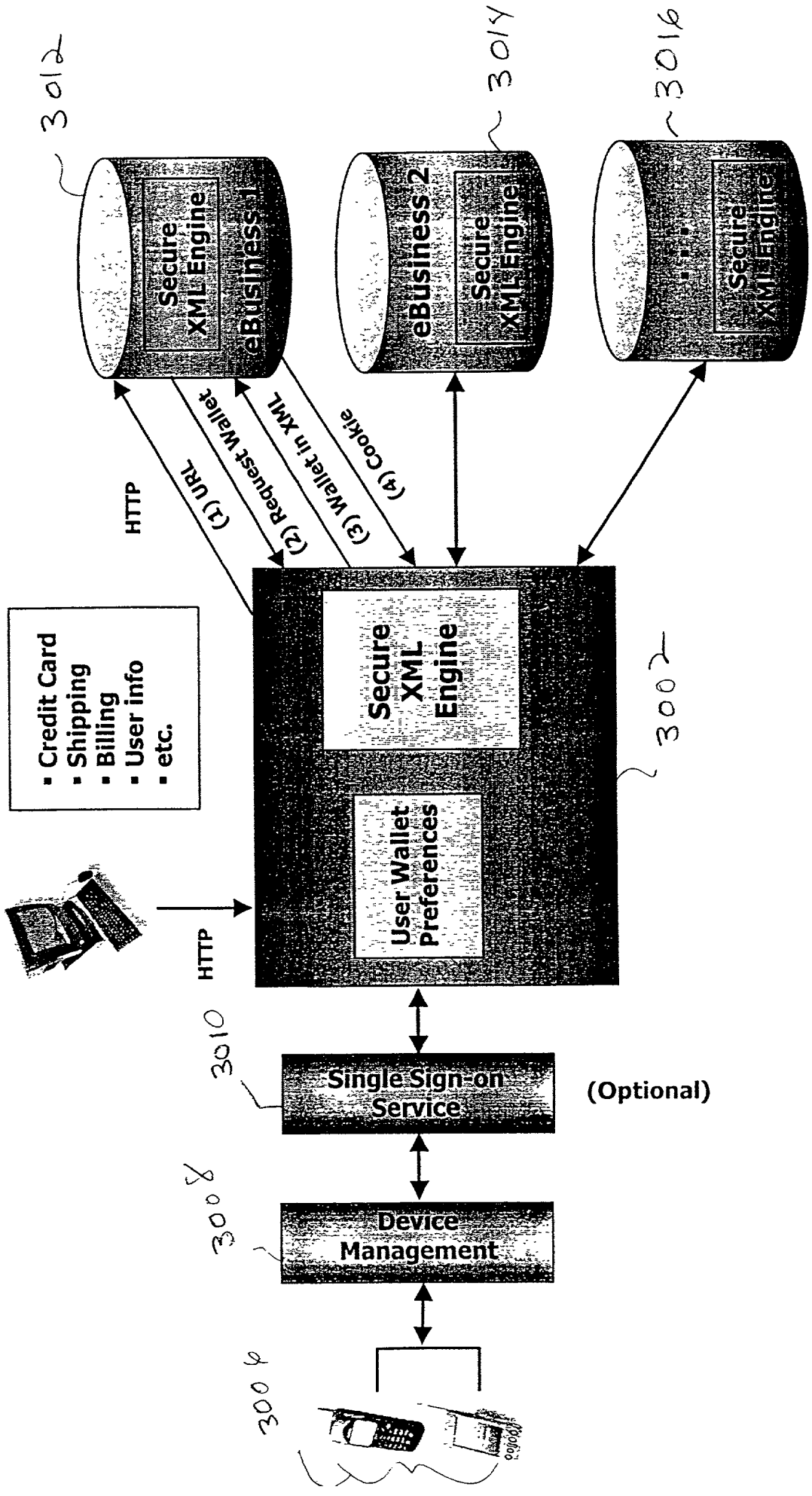


FIG. 30

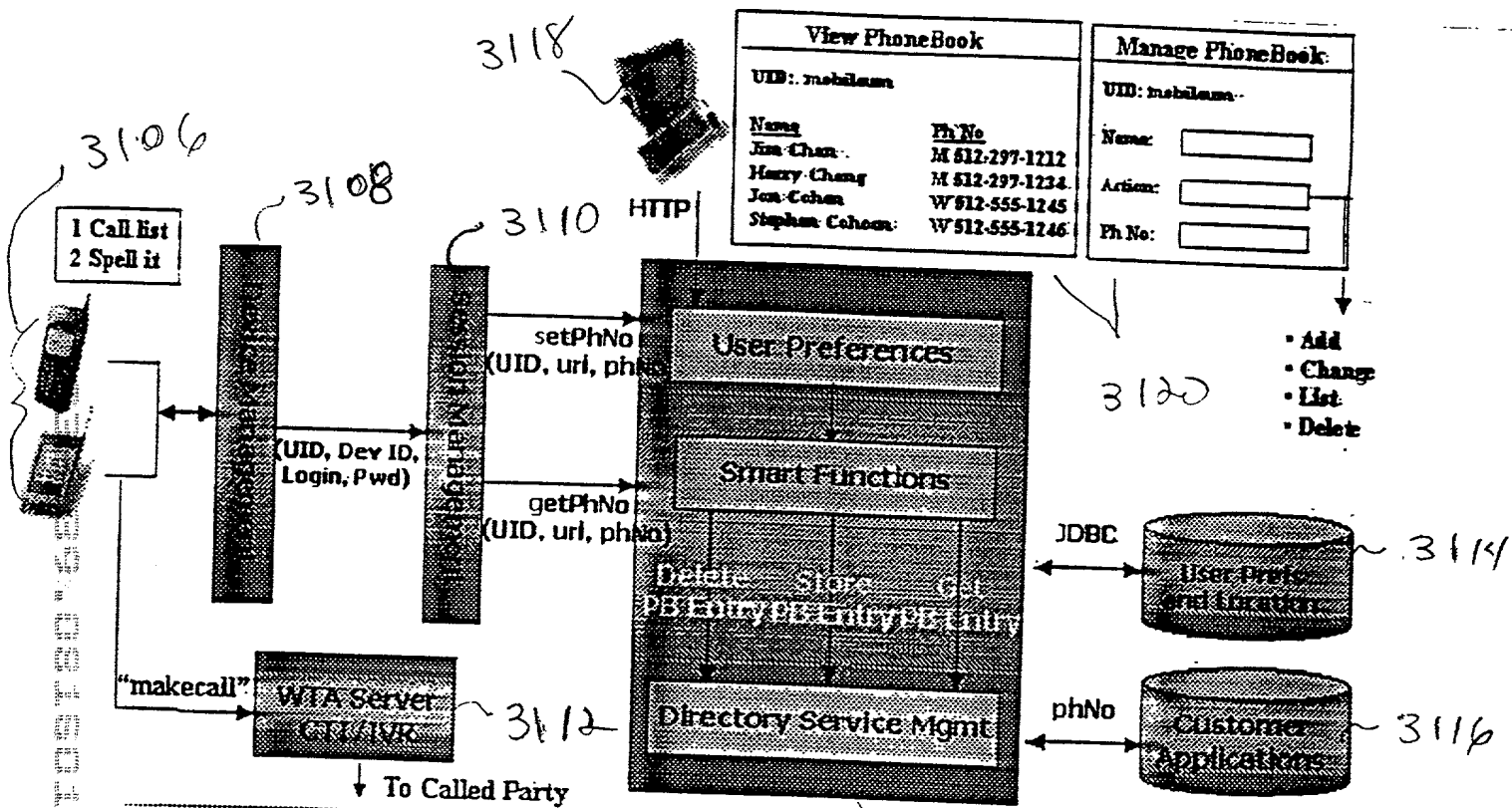


FIG. 31

Ski Reports:

1 ☐ Angel Fire

2 ☐ Alta

Base: 36'

New: 12'

Packed ice

OK Main

FIG. 32A

Choose Toppings:

1 ☐ pepperoni

2 ☐ sausage

3 ☐ meatballs

4 ☒ chicken

5 ☐ peppers

Pick Order

FIG. 32B

Radio Buttons:

1 ☒ Buy ☐ Sell

2 ☒ Day ☐ GTC

Change Submit

FIG. 32C

Choose Type of Pizzas:

1 ☐ deep dish

2 ☒ thin

3 ☐ hand-tossed

Choose Sauce:

4 ☒ red

Pick Order

FIG. 32D